ROADS *and* STREETS

UNIVERSITY MICROFILMS R6
EUGENE B. POWER
313 N. 1ST ST.
ANN ARBOR, MICH.
CONP-LRY-11-50

HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

A GILLETTE PUBLICATION

Gillette Publishing Co., 22 West Maple St., Chicago 10, Illinois • Accepted as Controlled Circulation Publication at Milwaukee, Wis.

This Month's Cover: High-speed bridge construction on the Kansas Turnpike (see page 30). . . . In This Issue: Road Show review, articles on earthmoving, electronic computer application, other timely subjects for engineers and contractors.

March 1957

pitch in and ditch...

This Gar Wood-Buckeye 308 Ditcher is designed for really rugged digging. Cross-country pipelining—the toughest gas, water, sewer, conduit and cable lines. Jobs that require day after day after day of high production service. That's why it's equipped with two-speed excavator drive, hydraulic conveyor drive, front drive transmission . . . powered by Chrysler!

CHRYSLER INDUSTRIAL 32

in-line 6 Engine (265 cu. in. displacement) powers Gar Wood-Buckeye Ditchers—and many other makes of equipment in the construction and materials handling field. There are five Chrysler in-line 6s, two V-8s—ranging from 230 to 413 cu. inch displacement. For detailed information about Chrysler Industrial Power write: ***Dept. G-3, Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.***

Chrysler
INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

. . . for more details circle 226, page 16

Over ¼ mile of pipe in one truckload!

Here goes more than 1400 ft of drainage pipe, made of Beth-Cu-Loy corrugated galvanized culvert sheets. What other type of pipe is light enough to permit such economical loading and transportation?

Light weight also makes Beth-Cu-Loy easy to handle when loading, unloading, or installing at the site. In smaller diameters it can usually be handled manually and even larger sizes rarely require expensive, heavy lifting equipment.

Yet light as it is, pipe made of Beth-Cu-Loy is strong because it's steel. Flexible, too, so that it flexes with the fill to help distribute the load peripherally. It conforms well to grade and alignment, and absorbs vibration, impact and the shifting effect of weather changes. Its copper content plus tight zinc coating make Beth-Cu-Loy corrosion-resistant.

Trenching for Beth-Cu-Loy pipe is less costly, for the trench need be only wide enough to admit the pipe. There is less earth to remove, less to replace. No breakage to allow for, either, with corrugated galvanized steel!

Beth-Cu-Loy galvanized sheets conform to the rigid specs of the American Association of State Highway Officials. If you would like further details about Beth-Cu-Loy for drainage purposes, just get in touch with any Bethlehem sales office, or with one of the fabricators using our culvert sheet steel stock, whose names we will gladly supply.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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ROADS AND STREETS

A GILLETTE PUBLICATION • MARCH, 1957 • VOLUME 100 • NUMBER 3

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● New Product Data—Over fifteen pages in this issue are given to new equipment items exhibited at the Road Show, or currently being announced by the manufacturers.

Coming Articles

How and Where to Light a Turnpike

Lighting details for the Florida Turnpike's interchanges, toll plaza and service areas will be described, together with electrical hook-up details of great interest to designers of Interstate projects.

Safe Blasting Alongside a Rail Line

How an eastern turnpike contractor maintained safety by keeping a berm built up between his work and the railroad.

Design of Prestressed, Pre-Tensioned Concrete

A design problem worked out in detail on a type of small-span bridge deck such as will be employed increasingly throughout the highway field.

Selection and Care of Construction Tires

What contractors need to know about latest tubeless, heavy-ply, extra wide tread, oversize, and other types of alternate tire equipment available for securing top efficiency on a particular project.

. . . And Many Other Subjects

Cement-Treated Base Material Centrally Mixed . . . Iowa's Pavement Widening Program . . . Bridge Girders Set by Leaning Highline . . . Why Contractors Must Take a Closer Interest in Mix Design and Control . . . Three Miles of Test Piles Driven to Determine Pile Lengths . . . Treating a Huge Slide Area; a Case Report . . . The AGC's Annual Convention in Washington.

Accepted as Controlled Circulation Publication at Milwaukee, Wisconsin. Published monthly. Subscription $5.00 per year.

14.8 MILLION YARDS TO MOVE, 56 BRIDGES TO BUILD,

IN 29.6 MILE DALLAS-FORT WORTH "SIX-CHUTER"!

Unlike most other turnpikes, the 6-lane Lone Star Speedway is being cut, filled, borrowed and spanned along a populated route, crisscrossed by many heavily travelled roads. To add to contractors' headaches, up to 300,000 gallons of water a day have to be trucked in for compacting. Note how self-propelled scrapers are *tandemed* to tackle the sun-hardened soil. Tires are Goodyear's wide-base Hard Rock Lugs—now standard on much original equipment.

Tire maintenance in field helps construction men beat tight work schedule.

OTHER 3-T NYLON CORD TIRES—CONVENTIONAL OR TUBELESS!

Look for this nearby Goodyear dealer sign for better tire values—better tire care.

. . . for more details circle 246, page 16

End tube and flap troubles FOREVER!

Specify Goodyear 3-T NYLON CORD *TUBELESS TIRES* on new equipment of every size!

Goodyear tubeless tires and rims are now *standard* on foremost original equipment—or supplied on specification.

In them, you get the regular Goodyear cost-cutting features PLUS many *new* savings of time, trouble and tire-cost-per-yard, possible only with Goodyear TUBELESS.

TO MENTION JUST A FEW: No tube or flap troubles—no tube replacements—easier mounting and dismounting—airtight assembly—cooler running—slow leaks instead of blowouts—easier repairs—simpler, re-usable valve-parts.

Get all the facts from your helpful Goodyear dealer. Goodyear, Truck Tire Dept., Akron 16, Ohio.

Buy and Specify **GOODYEAR**

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Road Lug, Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

USF BARRIER-BEAM

Note these famous USF design features: (1) deep corrugations for high impact resistance, (2) broad surface area for maximum visibility, (3) exclusive rounded Safety Top edge, (4) convenient off-post splicing for faster erection. Use economically for highways, parking lots, parks, race tracks, bridges and approaches.

USF UNIVERSAL-BEAM

A new, specially-designed beam-type rail that lays either end to traffic and solves stock problems because it is completely *interchangeable* with similar parts of other manufacturers. 9-bolt connection with oval neck bolts assures maximum joint strength.

Both Barrier-Beam and Universal-Beam are available in either 10 or 12 gauge.

Write for more complete information.

UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO
PRODUCTS
Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells • Highway Guard Rail • Bridge Flooring • Steel Forms for Concrete Bridge Floors • Corrugated Metal Pipe • Sectional Plate Pipe and Pipe Arches

USS STEEL

. . . for more details circle 311, page 16

ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 65 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

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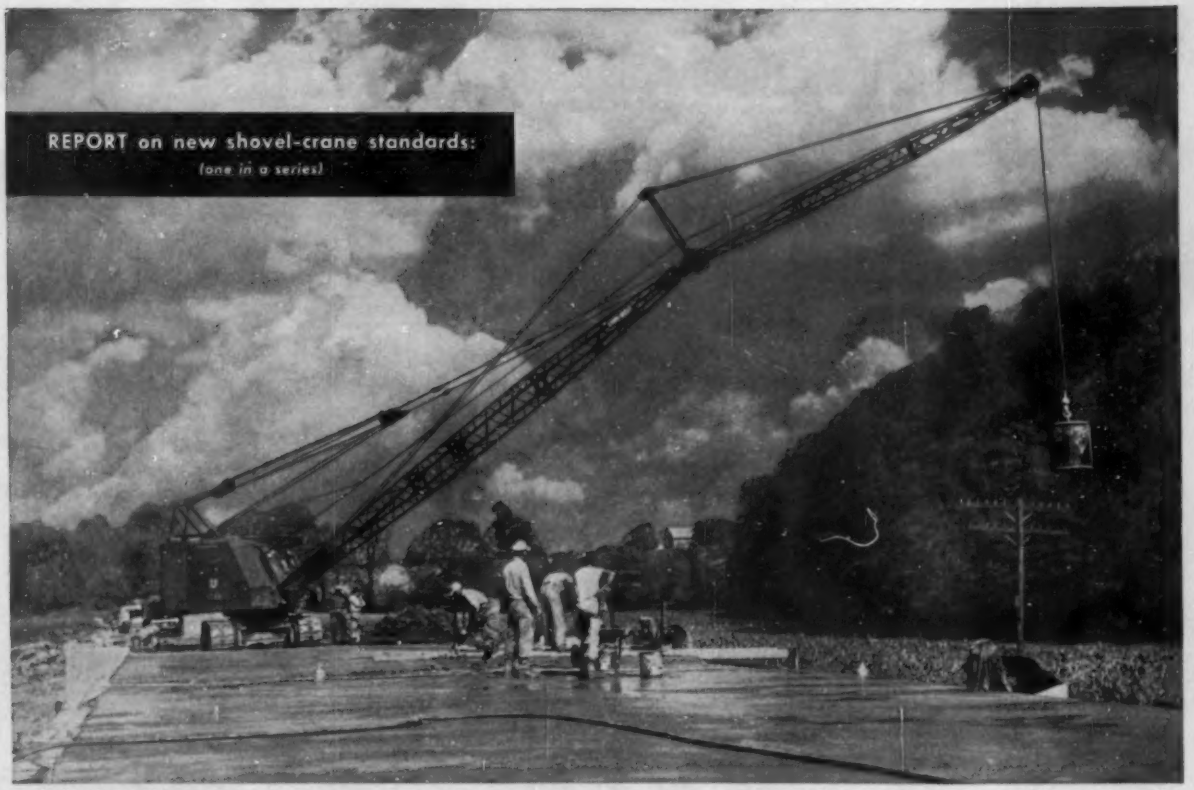


NEW FEATURES—Link-Belt Speeder shovel-cranes offer many important production-increasing advantages including reversing clutches for either or both main drums, a third drum and independent rapid boom hoist for power-raising and power-controlled lowering.

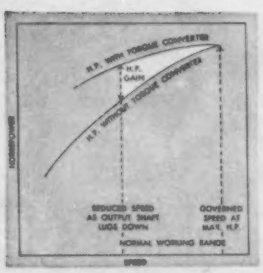
Getting bonus power...extra line pull

Size for size, Link-Belt Speeder shovel-cranes deliver greater usable horsepower than other machines using the same engines

Engine size alone is not a correct measure of a shovel-crane's actual *usable* horsepower. Thus, it's important to know Link-Belt Speeders deliver more *usable* horsepower or line pull at the drums than other machines using the same engine, yet remain well within engine manufacturers' recommended operating speeds.

Why? A Link-Belt Speeder is designed and built with extra size and strength in shafts, gears, clutches and structural members. It has the strength to fully utilize available engine power.

It's another reason why Link-Belt Speeder shovel-cranes are setting entirely new high standards of efficiency. For complete facts, contact your Link-Belt Speeder distributor or write—Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14,470-B



TORQUE CONVERTERS are available for all Link-Belt Speeder models, supply power to match the load . . . provide sustained power, increased line pull to maintain high production even with heavy loads and to handle these big loads smoothly, accurately!

POWER HYDRAULIC CONTROLS are operated with the flick of a finger, provide fast, positive response . . . perfect feel of the load for added safety. They're standard equipment on all crawler and rubber-tired models ½ to 3-yd, 8 to 75-ton capacities.

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

. . . for more details circle 270, page 16

"We're moving 30,000 yards a day—

TUNE IN:
METROPOLITAN
OPERA
radio broadcasts
every Saturday afternoon

TEXACO

TEXACO

. . . and that Texaco Plan certainly helps"

—says Project Manager Floyd Helm

Part of M-W & W's equipment task force that includes 29 scrapers and 20 dozers at work on 1.75-million-yard cut being made at a 30,000-yard-a-day rate. All equipment is 100% Texaco-lubricated and fueled.

Mr. Helm heads all field work for this joint venture of McCammon-Wunderlich Co. and Wunderlich Contracting Company. *The job:* construction of 4.9 miles of highway (relocated U.S. 40)—part of the approaches to new bridge across Carquinez Straits, California. All equipment is 100% Texaco-lubricated and fueled.

"Toughest part of this job," says Mr. Helm, "is a 1.75 million-yard cut. We're trying to keep blasting to a minimum and our rippers and scrapers really have a rough assignment. We're moving some 30,000 cubic yards per one-shift day and we couldn't do that if our equipment wasn't staying right on the job. That Texaco Simplified Lubrication Plan certainly helps. Our maintenance crew can handle all major lubrication with only six lubricants —no waste motion, no mistakes—and those Texaco Lubricants really stand up. We haven't had a single equipment failure due to lubrication."

THE SIX LUBRICANTS THAT M-W & W USE

For engine lubrication: *Texaco Ursa Oil Super Duty Special*—especially refined and processed to make engines deliver more power with less fuel over longer periods between overhauls.

For chassis and general grease lubrication: *Texaco Marfak*—stays in the bearings and gives long lasting, extra protection against wear and rust.

For wheel bearings: *Texaco Marfak Heavy Duty*—seals itself in, seals out dirt and moisture, requires no seasonal change.

For hydraulic units: *Texaco Regal Oil R&O*—keeps systems free from sludge, rust and foam.

For wire rope and open gears: *Texaco Crater*—keeps rope strong longer, assures smoother operation and longer gear life.

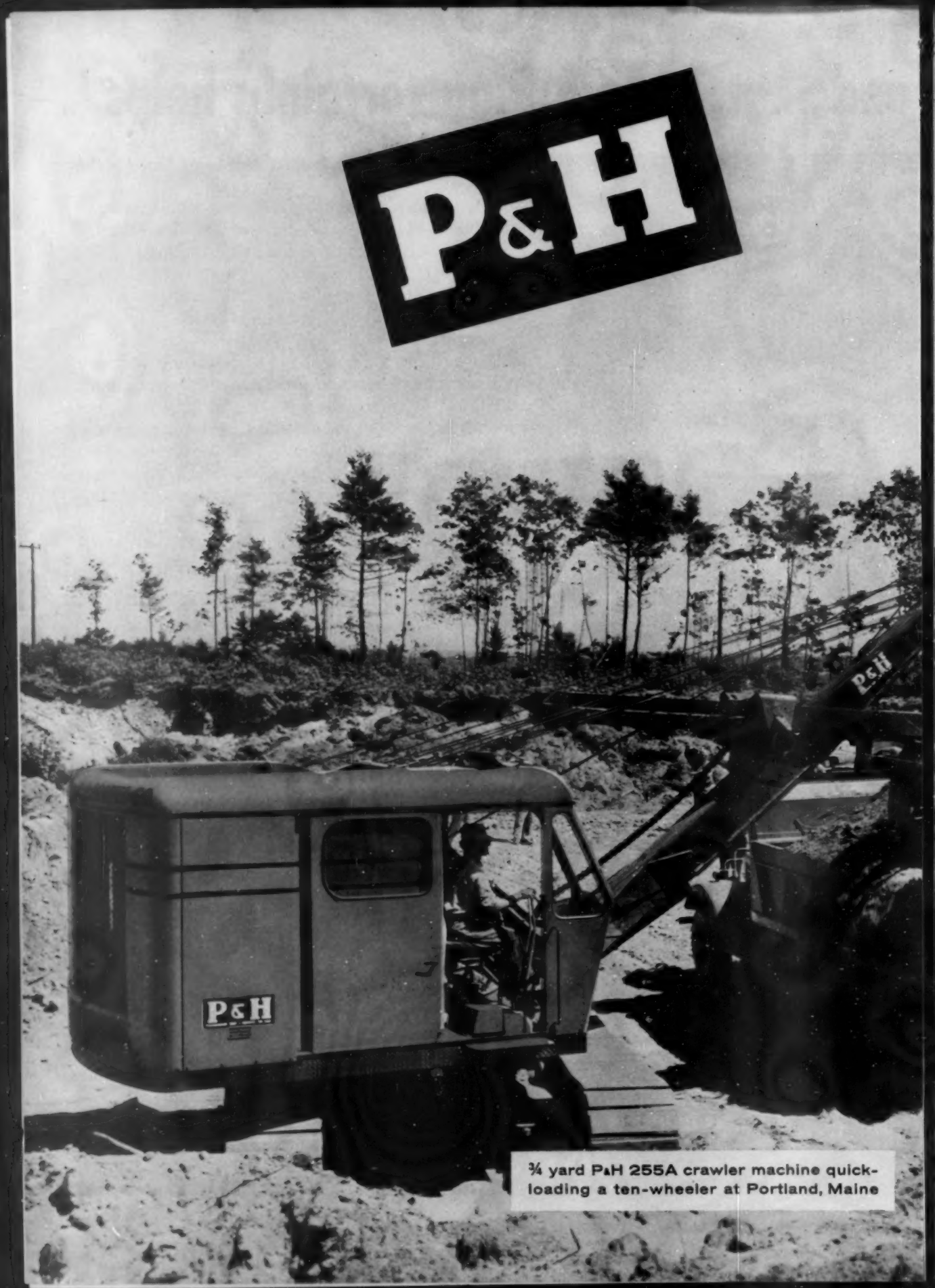
For enclosed reduction gears: *Texaco Gear Lube HD*—protects against wear under heavy loads, keeps gears running smoothly.

Let a Texaco Lubrication Engineer work out a Simplified Lubrication Plan for your projects. You'll save time, money and mistakes. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N.Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

. . . for more details circle 305, page 16



¾ yard P&H 255A crawler machine quick-loading a ten-wheeler at Portland, Maine

¾ yd. shovel has a mighty appetite

P&H 255A–first ¾ yd. power shovel--still the leader

P&H was the first to introduce a power shovel in the ¾ yard class and with today's P&H features the 255A continues to lead in profitable performance.

Contractors agree that the 255A with its dependable day-in and day-out production can dig more and lift more—faster and cheaper. In fact, many contractors agree that performance of P&H equipment is the big factor in determining their profits.

P&H profitable performance comes from a combination of features that are found only in P&H quality equipment. In the 255A you get famous P&H stability through better weight distribution and a low vertical center of gravity. You get smooth, fast, lively swings on the mammoth P&H live roller circle. P&H designed double adjustable hook rollers assure "even keel" swings. The 255A makes maximum use of alloy steel.

Add to these features the fact that equipped with a P&H Diesel Engine with its greater torque you'll get much greater production than with a gas engine. Yes!—this ¾ yard excavator has the mightiest appetite for work—at a potential profit.

Harnischfeger Corporation
Construction & Mining Division
Milwaukee 46, Wisconsin

THE P&H LINE Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 45 tons
Shovels: ½, ¾, 1½, 1¾, 2½, and 3½ yards

Across the country P&H machines lead the field in power, speed, flexibility, and profitable performance

CALIFORNIA
For handling loads up to 35 tons profitably there is the P&H 555A-TC. Here are Reliance Equipment's two 555A-TC units double lifting a precast concrete panel in the Vail Field Industrial Area, Los Angeles.

LOUISIANA
In the 1½ yard class, Schwartz Supply Co. profits from the lively swings and dependable performance of the P&H 655B. It is shown unloading material for their concrete mixing plant near New Orleans airport.

OHIO
Beavercreek Excavating Co. of Dayton depends on their ½-yard P&H 155A trench hoe to dig water mains and lay pipe economically and at a profit on State Highway 4 project in Butler County.

Write today For Bulletin X-71 On the P&H 255A Fully Convertible Crawler Machine

Harnischfeger Corporation, Dept. 509
Construction & Mining Division
Milwaukee 46, Wisconsin, U.S.A.

Gentlemen:
Please send me Bulletin X-71 on the ¾ yard P&H 255A

. . . for more details circle 247, page 16

*Name*_____

*Title*_____

*Firm*_____

*Street*_____

*City*_____ *Zone*_____ *State*_____

Before you buy any giant-sized
Measure TD-24 giant-sized

When you're 'dozing through rock and other materials, instant fingertip Hi-Lo shifting is a big cycle-speeder. And it cuts operator effort way down!

With full-time "live" power on both tracks, the TD-24 almost builds the road itself—hugging the mountain slope, giving added *operating ease, safety, and capacity!* That's another bonus from exclusive time-proven Planet-Power steering.

Try holding a 19-ton load on the blade with any other crawler this big—making a turn as this TD-24 is doing with both tracks pulling, while stockpiling coal with a special wing-type blade. The TD-24's operator can make "round-house," feathered, or pivot turns—with fingertip ease!

tractor advantages!

When you buy a big crawler look beyond sheer size and weight. You may be paying for enough extra "iron" to cause a startling jump in fuel and upkeep costs. So compare. Weigh bigness against provable working and earning capacity! Measure these giant-sized TD-24 advantages that have proven out over 8 years of on-the-job success!

Eliminates "dead-track drag!"

Does the giant you're considering steer with full-time "live" power and "live" traction on both tracks? TD-24 users by the thousands have proved that any crawler *this big* is obsolete without exclusive, time-proved Planet-Power steering advantages!

Planet-Power steering eliminates power-wasting, load-limiting "dead-track drag." Upgrade, downgrade, or on the level, you can smoothly turn a heavily-loaded TD-24—under positive control!

Does the big one you're looking at give cycle-speeding on-the-go shifting? The TD-24 does! And the exclusive two-speed planetary system teamed with a 4 speed synchromesh transmission —gives instant, stall-preventing and time-gaining Hi-Lo shifting, *without declutching.*

Does that big one you need have the genuine in-seat, seconds-fast, all-weather International gasoline conversion starting? Or the operating ease, power-transfer efficiency, and service-simplicity of the International Cerametallic-faced engine clutch? Or 8 practical speeds *forward and reverse?* Only the TD-24 has all these, plus dozens of other giant-sized advantages!

Prove to yourself the TD-24 beats all other giant-sized power—for *performance value*—for *big-scale ability to make you big money.* Ask your International Construction Equipment Distributor for a demonstration of a Gear-Drive or Torque-Converter TD-24!

. . . for more details circle 324, page 16

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Side-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

Heap-loading the sideboarded International *"75"* Payscraper in less than a minute proves the economy and efficiency of the TD-24 as a "pusher."

Shape to restore proper inverted V type crown as early as possible for best drainage and elimination of dangerous potholes.

Surface-treat with Columbia Calcium Chloride at a rate of 1 pound per square yard of surface, after sprinkling road with water.

Proper spring maintenance, supported by summer sweetening applications of Columbia Calcium Chloride, keeps roads firm, prevents dusting or raveling.

Now's the time to check aggregate, reshape roads, and get ready to spread Columbia Calcium Chloride

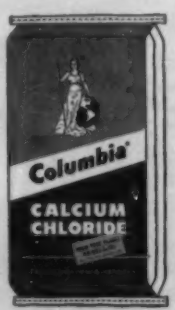
Good spring and summer roads are made right now! Smooth, compact, durable surfaces don't just *happen* . . . they're the happy result of your early maintenance, carried out this tested three-step way:

1. Check for proper balance of aggregate and binder in the roadbed, adding where necessary. 2. Reshape to proper crown while sufficient moisture is still in the ground. 3. Treat with Columbia Calcium Chloride.

Columbia Calcium Chloride aids so greatly in consolidating existing and added materials that only three or four blad-ings per year are usually necessary. Annual gravel loss is cut up to 75%, too. And what a help you'll find it in stabilizing shoulders. Lower maintenance costs, yet safer and more comfortable driving . . . no wonder Columbia Calcium Chloride is the preferred road treating chemical. You'll use it throughout the summer for effective dust control, as well.

We'll be happy to send you the latest information on new economies in road treatment. Contact your closest supplier or write directly to the nearest Columbia-Southern district office or to our Pittsburgh address.

New High Test Flake (95-98% $CaCl_2$) is now available as a companion product to Regular Flake (77-80% $CaCl_2$). Each 80-lb. bag of High Test does the job of a 100-lb. bag of Regular.



COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

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DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland • Boston New York • St. Louis • Minneapolis • New Orleans • Dallas • Houston Pittsburgh • Philadelphia • San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

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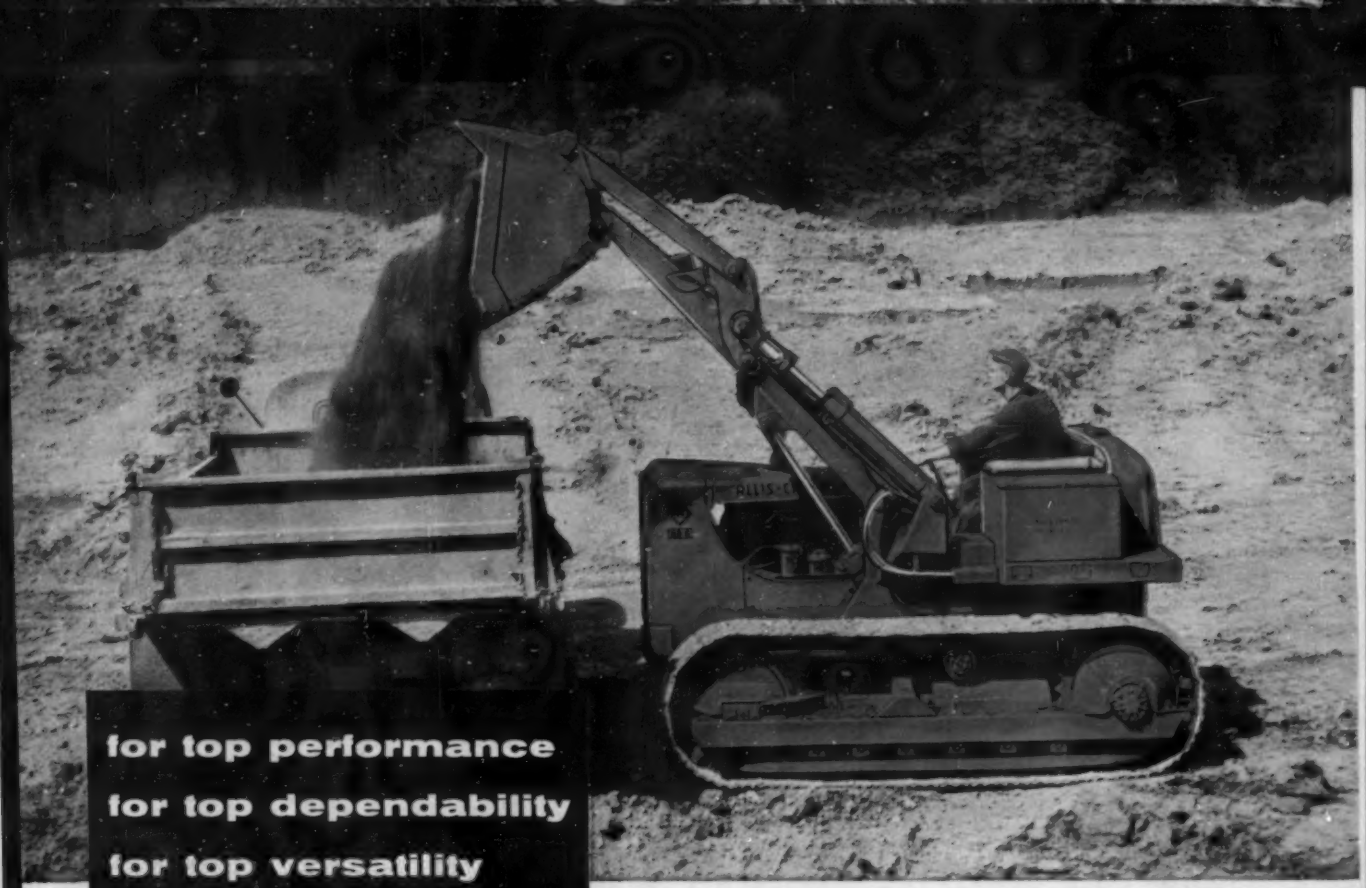

you can't beat an HD-6G

1½ yd bucket
72 net engine hp
19,600 lb

Look at the exclusive on-the-job advantages the Allis-Chalmers HD-6G gives you:

SIX-TRUCK-WHEEL STABILITY—almost 7 ft of track on the ground!

TWO-POSITION BUCKET—for big loads in loose or hard-packed material.

HEAVY WELDED-STEEL SHOVEL SIDE FRAMES and low stabilizer—for greater strength, low center of gravity, outstanding visibility.

ONE-PIECE STEERING CLUTCH AND FINAL DRIVE HOUSING—line-bored for true alignment of shafts and gears.

SIMPLIFIED LUBRICATION—including 1,000-hour lube intervals for truck wheels, idlers and support rollers.

Check these and dozens of other big HD-6G features now at your nearby Allis-Chalmers dealer . . . then see the HD-6G at work! Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

. . . for more details circle 333, page 16

ALLIS-CHALMERS *Engineering in Action*

WHAT'S NEW in Equipment and Materials

Nylon-Plastic Tarpaulins

A new tarpaulin, Rhinolyte, a fabric combining waterproof, rot-proof vinyl plastic and tear-resistant nylon, has been announced by Marsgood Plastics, 24 Van Housten St., Paterson 1, N.J.

A nylon mesh is inseparably laminated between two sheets of vinyl preventing cracking or peeling. Marsgood Plastics electronically welds this new fabric, achieving a completely waterproof seam as strong as the fabric itself.

Field tests have indicated that Rhinolyte is flexible to temperature of minus 50 degrees, unaffected by salt-water and strongly resists tearing and abrasion. A 20 ft. x 20 ft. heavy-duty tarpaulin weighs only about 37 lb.

For more information circle 101 on Service Coupon this page and mail now.

Puncture Sealment Prevents Flat Tires

A new type of asbestos base puncture sealment for tires, announced by United Rubbertex Corp., 260 Madison Ave., New York, N.Y., is injected directly through tire valve into tube or tubeless tires while the tire remains on the wheel.

Called Rubbertex, the product is a special asbestos base liquid that eliminates use of latex or synthetic rubbers, that cannot freeze, gum up or change characteristics under extremes of temperature. The material is non-flammable and will not chemically or mechanically affect operation of the tires or tire valves.

When a nail or sharp object penetrates the tire, Rubbertex immediately prevents any loss of air pressure by clinging to and sealing the intruding element. Then, after its removal, Rubbertex seals the puncture automatically and permanently as the tire rolls.

For more information circle 102 on Service Coupon this page and mail now.

Crush-Proof Hose for Contractors

A new crush-proof, smooth bore suction hose has been introduced for use in the contractor field, by Continental Rubber Works, 2031 Liberty St., Erie 6, Pa.

A special, springy Stycon synthetic rubber cord is used instead of wire. The Stycon cord is embedded in rubber between multiple piles of high-grade hose duck. Greater resilience is given to the hose so it snaps back automatically if flattened—either by trucks, contractor equipment or falling rocks.

For more information circle 103 on Service Coupon this page and mail now

Odometer Records Tractor Travel

A new feature designed to aid the machine owner in recording accurate job data has been announced by Caterpillar Tractor Co., Peoria, Ill.

A new type odometer, which accurately records the distances traveled by Caterpillar tractor-type tractors, is now available. The unit can be easily and inexpensively mounted on both spok-type and disk-type idlers.

The unit gives excellent accuracy in the low speed ranges, registering positive mileage in both forward and reverse gears. It will provide 98 percent accuracy in the lower three gear ranges. In fourth gear, 90 percent accuracy can be obtained.

The odometer is inoperative in fifth gear.

Since most jobs are performed in the lower speed gears, the odometer will supply a valid reading of working distances on most jobs.

For more information circle 104 on Service Coupon this page and mail now.

More Equipment News Pages 85, 122, 138

Triple Bin Aggregate Batcher

Cimco triple bin, a completely new product for low-cost aggregate batching, has been introduced to the construction market by Cimco, Box 422, Marshalltown, Ia. This batcher is stated to be a new idea, feauring patented "side and forward" hopper movement that gives operator easier control of the load.

The triple bin was designed to handle either 2 or 3 aggregates in batching, depending on the specifications for the individual job.

Triple bin comes either unmounted or mounted on wheels so as to pull at highway speeds of 40 to 50 miles per hour. On the mounted model, wheels and axles can be removed, if necessary.

For more information circle 105 on Service Coupon this page and mail now.

Seat for Construction Equipment

A new bucket suspension seat for heavy-duty construction and earth-moving equipment has been introduced by the Bostrom Manufacturing Co., 133 W. Oregon St., Milwaukee, Wis.

The seat is designed with a rubber torsional spring suspension system that soaks up the damaging shocks and vibration inherent in the operation of heavy-duty equipment. This not only provides equipment operators with more efficient working conditions but also cuts down on time lost due to driver fatigue.

For more information circle 106 on Service Coupon this page and mail now.

(Continued on pages 85, 122, 138)

MAIL THIS COUPON TODAY!

ROADS & STREETS
22 West Maple Street
Chicago 10, Illinois

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Please send me further information on products and materials mentioned in the March Roads & Streets as circled below

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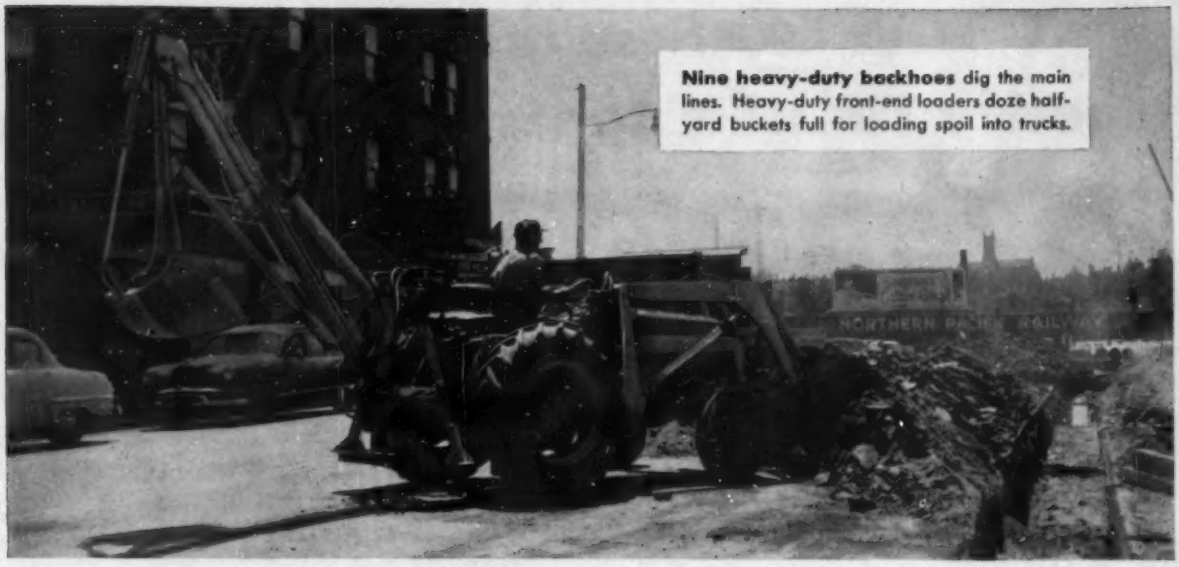
NOT GOOD AFTER APRIL 15, 1957

A READER SERVICE FOR YOUR NEEDS



Nine heavy-duty backhoes dig the main lines. Heavy-duty front-end loaders doze half-yard buckets full for loading spoil into trucks.

700 miles of gas line trenching

...dug with 14 International® Utility tractors

Four rear-mounted trenchers dig the lateral lines. There's a crawl speed to match any digging job . . . variable from 0 to 600 feet per hour at the touch of a lever.

Natural gas for the Pacific Northwest! Over 700 miles of main and lateral gas lines will soon give city-wide distribution for Spokane, Washington. All trenching is being done with rugged, work-eating International 300 Utility tractors . . . chosen for exclusive use on this job by Hall-Mac Construction Co., Houston, Texas.

Up to 1,000 pounds greater built-in weight in this rugged utility tractor gives greater backhoe pressure for faster digging . . . traction for bigger loader bites.

Work-speeding options also cut costs. *Integral power steering* saves time and effort in turning and loading. *Time-saving Torque Amplifier* boosts push or pull power up to 45 per cent . . . on the go, gives 2 speeds in each gear.

There are 5,000 IH dealers for prompt sales-service *wherever* your job is located! Your IH dealer will demonstrate. Look in the classified . . . call today!

See your

INTERNATIONAL HARVESTER DEALER

International Harvester products pay for themselves in use—McCormick Farm Equipment, Farmall and International Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.

. . . for more details circle 235, page 16

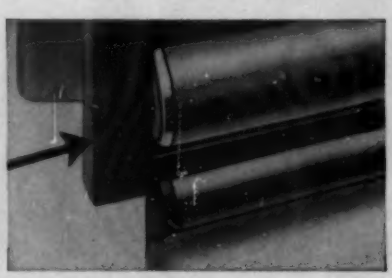
FOR 1957

...the new, still more powerful INTERNATIONAL 350 UTILITY

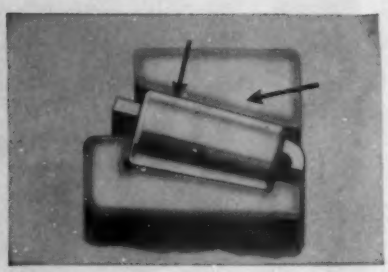
Response like you've never known! Feel the smooth, new power of the engine. See the new, even more rugged, extra-heavy-duty front axle. Add these to many other time-tested features . . . the new International 350 Utility gives greater cost-cutting capacity than ever. Choose gasoline, LP Gas, or diesel engine.

Get all these advantages . . . specify TIMKEN® tapered roller bearings

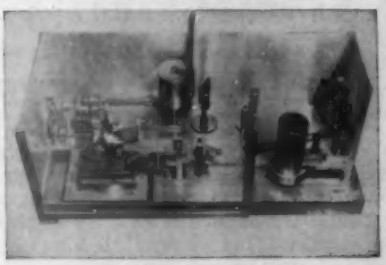
THERE ARE 27 TYPES of Timken® tapered roller bearings. This wide selection means you get the bearing design exactly suited to your job. Whatever your bearing application problem, we can help solve it.



THE SOFT STEEL CAGE used in Timken tapered roller bearings separates the rollers, keeping them spaced evenly. This prevents scuffing of the rollers, adds to the bearing life and gives you more for your money.

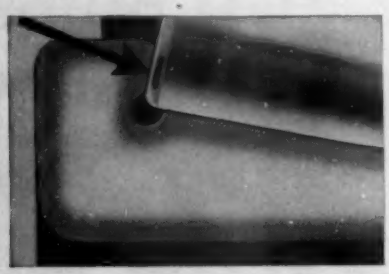


HARD ON THE OUTSIDE, tough on the inside. To take shock loads, give longer life, Timken bearing rollers and races are case-carburized to have a hard, wear-resistant surface over a tough, shock-resistant core.



MICRO-INCH FINISH is standard for Timken bearings. This profilograph checks contours and smoothness of circular surfaces to a millionth of an inch, helps us make Timken bearings truer, quieter, longer-wearing.

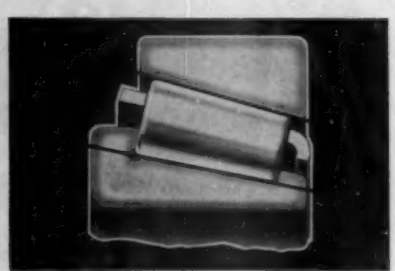
6,525 SIZES, the world's largest selection of tapered roller bearings. From bearings smaller than your finger to 71½" in inside diameter, the Timken Company can supply the size you need for any specific application.



POSITIVE ROLLER ALIGNMENT is assured because the taper in Timken bearings holds ends of rollers snug against the rib. The taper in Timken bearings lets them take radial or thrust loads or any combination.

ACCURATE TO 50 MILLIONTHS of an inch. This Universal Measuring Machine checks gages and machine parts used to make Timken bearings. Our gage laboratory, one of the world's best equipped, helps make Timken tapered roller bearings your No. 1 bearing value.

WE MAKE OUR OWN FINE ALLOY STEEL. No other American bearing maker does. This spectrometer helps control steel quality—in 40 seconds gives the exact chemical analysis of a melt. In a few minutes, results are flashed to the melter. It's another step in rigid quality control.



FULL LINE OF CONTACT between Timken bearings' rollers and races gives them *extra* load-carrying capacity. To get *all* these advantages, specify "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.

. . . for more details circle 307, page 16

ROADS AND STREETS
Sixty-Five Years of Editorial Leadership

Washington News Letter

By Duane L. Cronk

March 10, 1957

The effect of modern equipment on labor requirements in highway construction is the subject of a study just released by two Bureau of Public Roads engineers. Edwin J. Coppage, chief of the Bureau's Construction Management Section, and Edwin L. Stern, supervising highway engineer, report a pronounced decrease since 1944 in the number of man-hours required in roadbuilding, a development basically due to "great strides made by manufacturers in developing more efficient equipment."

Because of machinery improvements, the experts say, manpower requirements dropped a significant 43% - from 217,700 man-hours per $1 million of construction in 1944 to 123,000 man-hours in 1955.

* * *

To further simplify road paving specifications, the Asphalt Institute has reduced the number of grades of paving asphalts from nine to five. Four are basic paving grades, listed as 60-70, 85-100, 120-150 and 200-300 penetration. A fifth of 40-50 penetration is recommended for special uses. The need to streamline materials specifications has been recognized by highway officials for some time, and such modifications become particularly pertinent under the pressures of the accelerated roadbuilding program.

The Institute also plans to reduce the number of grades of rapid-curing, medium-curing, and slow-curing groups of liquid asphalt.

A bill which would reduce the cost of new highway bridges over navigable waterways has been introduced in the Senate. The proposed legislation would amend an existing rule that the Corps of Engineers must approve bridge plans "in the interests of public navigation." Highway officials believe that undue concern for navigation has frequently forced them to design and construct structures with unnecessarily high clearance, at considerable cost.

The Senator's bill would change the wording of the General Bridge Act of 1946 to recognize the equal rights of all surface transportation and purposes that clearances be on the basis of the "total economic effect" on surface transportation.

* * *

An unfortunate weakness in the National Highway Program is coming to light these days. In drafting the federal legislation, the Congressmen submitted to pressure from public utility interests and agreed that if a state reimburses a utility for relocation costs necessitated by highway construction, federal funds may be used in partial payment. Witnesses testified in hearings that such a practice would drain off $1.5 billion from Interstate construction funds alone.

The result is a rash of bills before state legislatures this month which would require state highway departments to reimburse utility owners for costs

of relocation, not only on the Interstate System but on the entire 700,000-mile federal-aid network. In various forms, such bills are confronting at least 14 states. Heretofore, most states have insisted that utilities exist on highway rights-of-way by suffrage and should be required to bear the cost of relocating their facilities, rather than divert construction funds to that purpose. Undoubtedly, before this switch in basic philosophy runs its course, billions of dollars in construction funds will be diverted to this purpose.

* * *

A national society of engineers has registered forceful protest to the Bureau of Public Roads against the Bureau's attempts to frustrate "pirating" by engineering consultants of state highway department personnel. The federal agency had asked the states to insert a clause in their contracts with consultants forbidding them to employ department engineers. Highway officials have been concerned about the danger of outside firms building up their staffs with departmental personnel, lured away by the promise of higher salaries.

Such a practice would freeze men in their present positions, frustrating the most capable engineers or forcing them out of the highway program entirely, the National Society of Professional Engineers objected last month. It would also encourage unionization.

The real cause of the engineering shortage on highway department staffs is the differential between state salaries and salaries paid by industry, and the BPR's stand on "pirating" seeks only to cure a "symptom," the society maintained. Meanwhile, the Bureau reports, all the states are continuing to use the clause in their engineering contracts.

The continued rise in the cost of highway construction has slackened for the first time since 1955, the Bureau of Public Roads disclosed recently. The price level index has been rising steadily from a low of 125.5 points in the second quarter of 1955 (using 1946 as the base year of 100 points), to 140.5 in the third quarter of 1956, an average increase of 3 points each quarter.

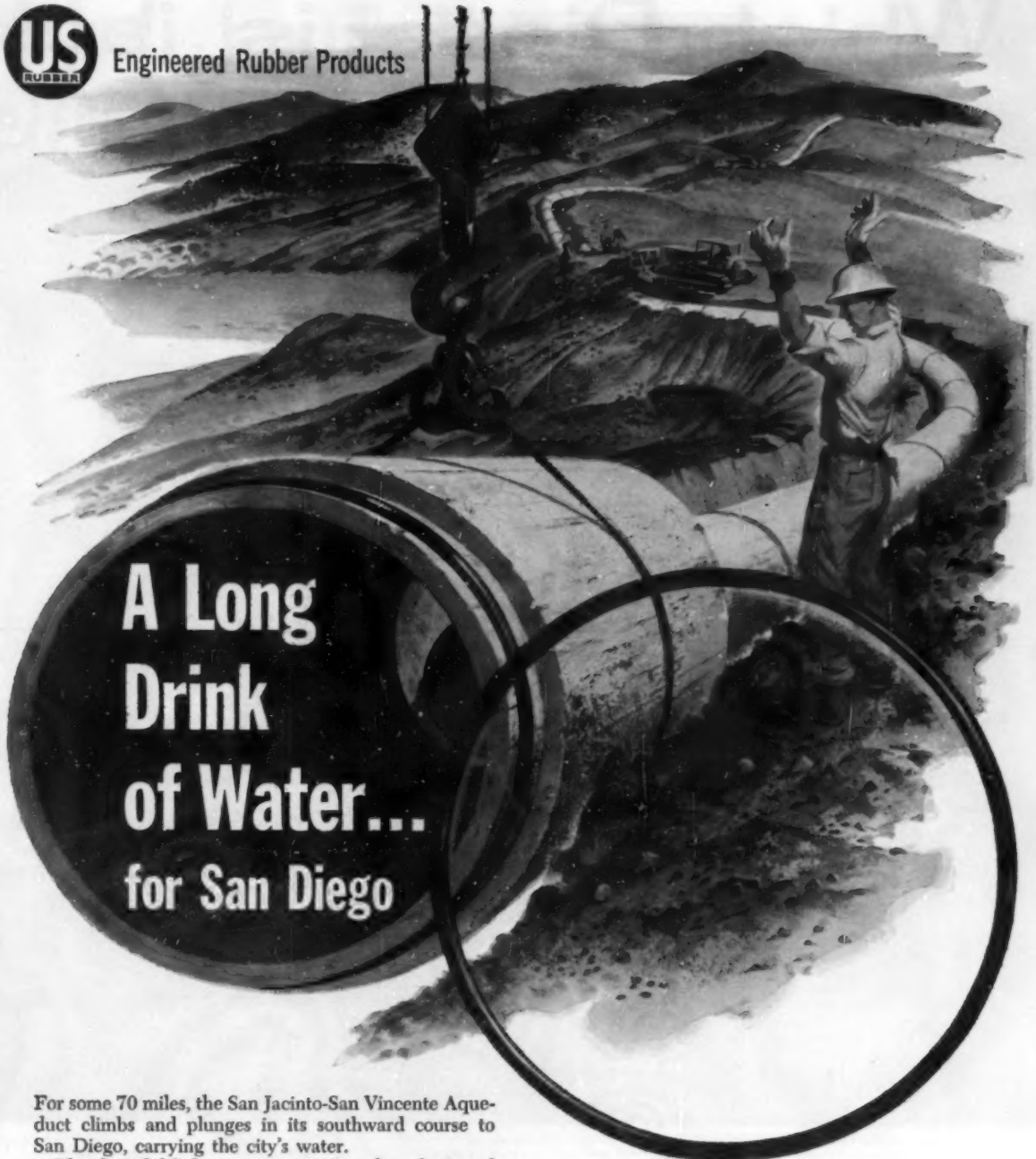
Highway officials, watching the upswing with concern, have expressed relief to learn that the index for the fourth quarter was 140.7, only 0.2 point higher than the previous quarter. They refuse to believe that a definite turning point has been reached, however.

* * *

The fear that rural road construction may be neglected during the rush to build the Interstate System is reflected in a move to give county engineers a greater voice in Washington. Senator Dennis Chavez, chairman of the Senate Public Works Committee, has introduced a bill which would create an advisory committee of 24 county officials. Their job — to work closely with the Bureau of Public Roads to continue the uninterrupted development of rural road systems.

Committeemen would advise the federal government on such matters as: (1) providing a sufficient number of access roads to the Interstate System through rural areas, (2) developing proper zoning regulations in rural areas and financing local planning studies, (3) improving safety conditions on secondary roads, and (4) studying the economic effect of by-passes on rural communities.

US RUBBER Engineered Rubber Products



A Long Drink of Water... for San Diego

For some 70 miles, the San Jacinto-San Vincente Aqueduct climbs and plunges in its southward course to San Diego, carrying the city's water.

This liquid life-line uses over 28 miles of 48 and 54-inch reinforced concrete pressure pipe equipped with steel joint rings.

These steel joint rings—about 8,500 in all—are sealed with U. S. Rubber round gaskets, made by the unique process of *continuous molding*. This process is exclusive with U. S. Rubber. Continuous molding produces the only seals that provide minimum compression set, precise tolerances (down to .008 if needed), and long life —all at reasonable cost.

This continuous molded gasket is only one of thousands of examples of how "U. S." experts engineer rubber and plastic parts in mass-production—yet at exacting tolerances. For your next construction job, contact any of the 28 "U. S." District Offices or write us at Rockefeller Center, New York 20, N. Y. In Canada, contact Dominion Rubber Co., Ltd.

US RUBBER Mechanical Goods Division

United States Rubber

. . . for more details circle 310, page 16

Which Diesel is jack

It's GM . . . Choice of over 150 equipment builders

Jack of all jobs—*and master of all*—General Motors Detroit Diesel engines power machines built by over 150 leading equipment manufacturers. They handle more different construction jobs than any other Diesel.

These flexible 2-cycle Diesels drive 117 models of excavators, cranes and draglines built by 23 manufacturers; 11 different makes of portable and stationary air compressors; plus rock crushers, pumps, loaders, and the world's most powerful tractors and earth-movers.

In fact, GM Detroit Diesels lead as the work horses of industry—proving their superiority over both gasoline engines and other Diesels in more than 1,000 different applications of power machinery on jobs from 30 h.p. up.

For dependable, moneysaving power in sensible size and weight, it will pay you to specify GM Detroit Diesel in any equipment you build, buy or repower. It's America's FIRST CHOICE Diesel *because it does more work at less cost!*

Single Engines...30 to 300 H.P. *Multiple Units...Up to 893 H.P.*

# of all building trades?

Shown above are Thew-Lorain backhoe, Marion cranes, Ingersoll-Rand air compressor, and LeTourneau-Westinghouse rear dump. Write for booklet listing over 1,000 GM Detroit Diesel power applications.

GM
GENERAL MOTORS
DIESEL POWER

DETROIT DIESEL

Engine Division of General Motors
Detroit 28, Michigan

Regional Offices:
New York, Atlanta, Detroit, Chicago, Dallas, San Francisco

In Canada:
GENERAL MOTORS DIESEL LIMITED, London, Ontario

America's First Choice Diesel Engine

. . . for more details circle 244, page 16

● Model 80-D on the contract of Tecon, Graff, Parsons.

● Two Northwests on the Grass River Bridge, D.W. Winkelman contract.

● Northwest Pullshovel owned by Iriquois Construction Co. on a lock job.

58 NORTHWESTS on the St. Lawrence Seaway

These contractors have a total of 58 Northwests on the St. Lawrence Seaway

Mannix Ltd.
Beaver Construction Co., Ltd.
John Susin Construction Co.
Desourdy Construction Ltd.
St. Denis Construction Co.
McNamara, Pigott & McQuigge
Iriquois Constructors
Walsh (Canada) Ltd.
Northern Construction Co.
J.W. Stewart
Cornwall Sand & Gravel Ltd.
C.A. Pitts
Atlas, Winston
Walsh, Perini Morrison-Knudsen, Kiewit, Utah Construction Co.
S. Perini & Sons, Walsh, Morrison-Knudsen, Kiewit, Utah Const. Co.
Morrison-Knudsen, Kiewit
Dravo Corporation
D.W. Winkelman Co.
Tecon, Graffe, Parsons
Dutcher Construction Co.

Remember the Turnpikes—the New York Thruway (more Northwests than any other make)—the West Virginia Turnpike (over half the shovel and crane equipment Northwests)—the Ohio Turnpike, the Kansas Turnpike, the Maine Turnpike Extension, the Massachusetts Turnpike, the Connecticut Turnpike, all dominated by Northwest equipment.

Here is another world famous job—a job involving everything from rock to simple material handling—another job predominantly Northwest equipped—over 58 Northwests handling all types of work from Shovel and Pullshovel excavation to Dragline and Crane jobs.

If you are planning on Shovel or Crane equipment, the outstanding leadership of Northwest on both big jobs and small is worth thinking about. There *is* a reason—Northwest Advantages make money. Plan now to have Northwest equipment. Let a Northwest Man give you complete details.

PRODUCTION PLUS · $ · MEANS MONEY

NORTHWEST ENGINEERING COMPANY
1504 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Allis-Chalmers low-cost Model D
BIG in power, strength, versatility

The Model D grader has the power to tackle hundreds of grading jobs profitably. With either 50-hp gasoline or 50-hp diesel engine, it offers plenty of torque and lugging ability.

Big-grader design means long life for the Model D, too. Strong, single-member tubular main frame . . . husky drawbar and one-piece circle . . . ROLL-AWAY moldboard . . . ground-gripping tandem drive . . . they're all plus performance advantages.

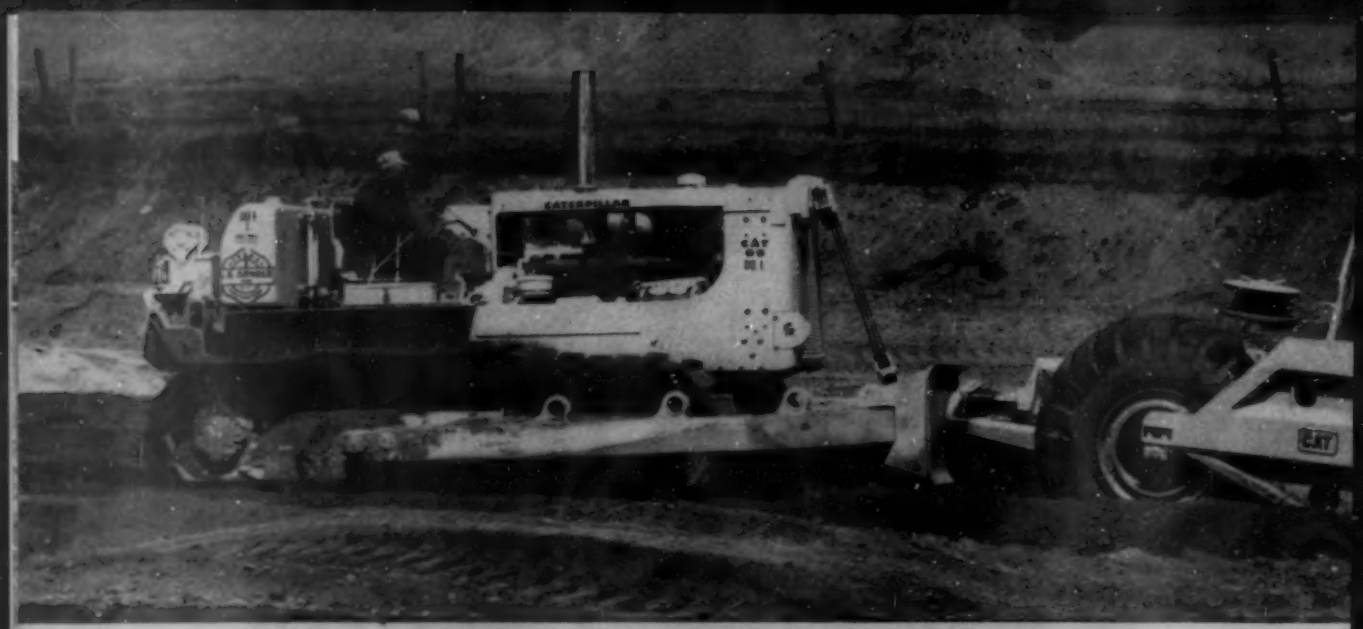
Job-multiplying attachments make a big difference in extending the Model D's versatility . . . include a midship-mounted hydraulic scarifier and rear-mounted ⅝-yd loader. Other optional equipment includes power circle turn, shiftable moldboard, leaning front wheels and an all-weather cab.

To keep the profitability in your grading operations, see the Model D now. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ROLL-AWAY is an Allis-Chalmers trademark.

. . . for more details circle 200, page 16

ALLIS-CHALMERS *Engineering in Action*



DOES THE KING OF THE CRAWLERS PAY ITS WAY?

Let's talk push-loading. We'll use some figures—that's the only way to tell a dollars-and-cents story.

On a job in Munsing, Michigan, not long ago, a Caterpillar D9 Tractor and a competitive machine were both push-loading in moist sand with some gravel in it. The other machine loaded 18.3 cu. yd. in .91 min. That's 20.1 cu. yd. a minute. The D9 pushed 18.5 cu. yd. into the scraper in only .58 min. That's 31.9 cu. yd. a minute. In other words, the D9 loaded over 50% faster than the other machine, and developed a larger load while doing it.

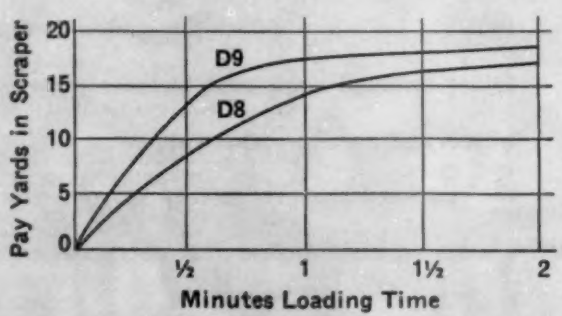
In Belmont, N. C., a D9 and a different competitor were push-loading in sandy clay. The other machine handled 15.3 cu. yd. in .67 min. Or 652 cu. yd. an hour. The D9 handled 17.2 cu. yd. in .42 min. Or 860 cu. yd. an hour. This was a half million cubic yard job; the D9 could have completed it in 3½ weeks less time than the other machine.

On a job in Minot, N. D., on another in Atlanta, Ga., the story was much the same.

Compare a big yellow machine with another big yellow machine

Maybe the best way to spell out how the D9 can boost profits is to compare its performance not with another make but with this famous CAT* D8 Tractor.

Owners and operators know what the D8 will do. Pound for pound, it's the best-producing crawler in its class today. The D9 is bigger, has more power. Does this added size and power really make a difference? Look what happens when you have a D8 and D9 both pushing DW21-No. 21 units on the same job:



D9 push-loads DW21 with No. 470 Scraper on highway job in Wisconsin. Ten-mile job calls for handling 120,960 yards, mostly sandy gravel. D9 loads DW21 in gravel in 70 seconds here, with heaping loads up to 25 yards. Vice President F. L. Carr of L. G. Arnold, Inc., says, "The D9 pusher has more than lived up to our expectations." Grade Superintendent Phil Dudenhoefer adds, "Outproduces by far any other machines on the job."

Forget size, weight, horsepower. Forget toughness and agility. These only point to what counts most: out on the job, how does the D9 really stack up against competition in cost-per-yard?

Or compare these two big yellow machines this way. Say on a job your haul distance averages 1,875 feet and you're using three DW21-No. 21s with one pusher. If that pusher is a D8, you stand to average 344 yards an hour. If it's a D9, you'll get 412.

Now, say your spread is made up of the pusher and the three wheel units, plus a No. 12 Motor Grader and another crawler with 'dozer and roller. Figure your hourly owning and operating cost. Count in the depreciation, taxes, gas and fuel, lube oil, grease, repairs and labor, and operators' wages. If your pusher is a D8, a reasonable figure for the spread would be $73.52 an hour. If it's a D9, your costs could come to $77.32. But remember, you're getting 344 yards with the D8, and that comes to 21.4¢ an hour per yard of dirt. With the D9, you're getting 412 yards at $77.32 an hour—which figures out at 18.7¢ per yard of dirt.

The D9 would save you 2.7¢ per yard, *and* give you 68 more yards, each and every hour.

Naturally, these figures might not exactly match your own. But they are figures based on actual performance records and they tell an honest story.

Would the D9 make more money for you?

There are jobs that would not warrant a D9. With the rugged D8 available, there may be no need to call in the 29-ton, 320-flywheel-HP D9. But the above figures certainly prove this much: on job after job, the D9 *is* paying its way, no matter how close the records are kept. One of these jobs could be yours.

But don't just take our figures for it. Call your Caterpillar Dealer. Have him demonstrate the D9 on your job. Check it with *your* watch, in *your* dirt, against *your* books. *That'll* tell the tale.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

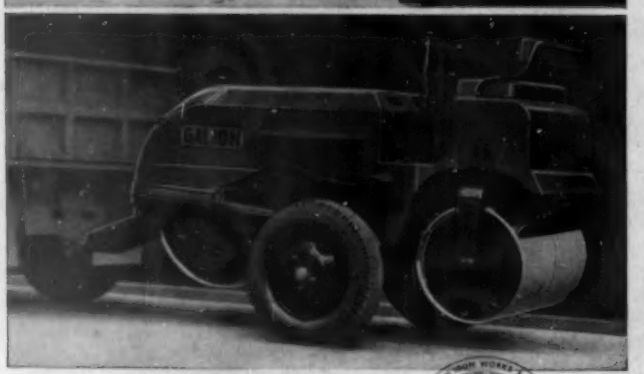
*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE D9— PROFIT BUILDER

Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment

. . . for more details circle 216, page 16

GALION 3-5 and 4-6 TANDEM and PORTABLE TON ROLLERS



SMALL ENOUGH FOR
Economical Maintenance

LARGE ENOUGH FOR
Many Surfacing Jobs

All of these rollers have 4 cyl. 25 h.p. engines, 48" diameter, 42" wide compression rolls, hydraulic steering, and straight line spur gear final drives.

TANDEM ROLLER

This 3-5 Ton Variable Weight Tandem Roller is easy to operate and maneuver. You'll find it profitable on new construction, maintenance and repair work.

PORTABLE ROLLER

Easily towed by truck from job to job. Widely used for patch work, rolling drives and parking lots, resurfacing of secondary roads, etc. Variable weight from 7,100 lbs. to 9,765 lbs.

RETRACTABLE WHEEL TANDEM ROLLER

A 4-6 Ton Variable Weight Roller that you can tow to jobs speedily and safely. Hydraulically operated retractable wheels with heavy-duty pneumatic tires quickly raise the complete roller off the ground when hitched to a truck.

Write for literature

OTHER GALION Variable Weight ROLLERS

3-AXLE TANDEM ROLLER
14-20 Ton

2-AXLE TANDEM ROLLERS
5-8, 8-10½, 8-12, and 10-14 Ton

"CHIEF" 3-WHEEL ROLLERS
4 Sizes-10 to 16 Ton
(Also available with spoke-type rolls)

"WARRIOR" 3-WHEEL ROLLERS
2 Sizes—7 to 10 Ton
(Also available with spoke-type rolls)

All the above rollers are equipped with ROLL-O-MATIC Drive as STANDARD EQUIPMENT.

TRENCH ROLLER
8785 to 10220 lbs.

ESTABLISHED GALION 1907

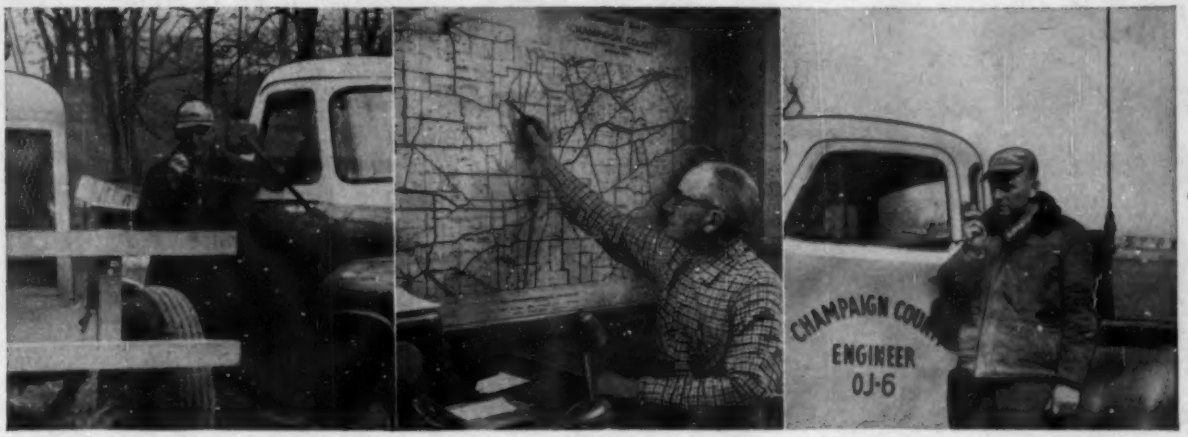
GALION 1907 50th ANNIVERSARY 1957

THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.
Cable address: GALIONIRON, Galion, Ohio

. . . for more details circle 241, page 16

"2-way radio is our best and lowest cost maintenance-construction tool"

SAYS NORTH H. NEWTON, CHAMPAIGN COUNTY ENGINEER, URBANA, OHIO



Foreman, miles away, gets question answered in minutes, not hours.

Radio operator Lewis Metherd checks location of sudden snowfall, prepares to shift crews.

Radio-equipped foreman checks garage in seconds about needed repairs.

"Fast and quick communication is just as essential to any highway department as it is to a military commander. And, for the past 2 years, Motorola 2-way radio has given us just that—multiplying our efficiency and productivity every day of the year.

"With all crews and foremen in constant touch with each other and the dispatcher in our office, information can be passed along in minutes, no matter where they are. Hours, even days, can be saved in meeting emergencies, and everyday work is handled with no lost motion and no waste time. Costly crews and equipment are shifted from job to job while still in the field. Snow removal, bridge repair, washed out roads, black topping, equipment breakdowns—all are taken care of faster with the help of our Motorola radios. And better service means better public relations too, a valuable asset anytime.

"I could fill a book with stories on how radio has saved us time and money. It's the most inexpensive piece of equipment you'll ever buy . . . so low you can't afford to be without it. The closer knit organization you'll have will give you better control over *all* your operations, and actually *save* you money at the same time."

What stronger recommendation for 2-way radio can there be? Investigate, and find out how *Motorola* 2-way radio can help you do the job better and at a lower cost.

MOTOROLA

2-WAY RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
A SUBSIDIARY OF MOTOROLA, INC.
4501 AUGUSTA BOULEVARD • CHICAGO 51, ILLINOIS

Motorola consistently supplies more mobile and portable radio than all others combined.
Proof of acceptance, experience and quality.
The only COMPLETE radio communications service—specialized engineering . . . product . . . customer service . . . parts . . . installation . . . maintenance . . . finance . . . lease.
"The best costs you less—specify Motorola."

. . . for more details circle 267, page 16

Here's why you should make PRESSTITE-KEYSTONE a

for all your paving & building product needs

- EXPANSION JOINTS: PREMOULDED ASPHALT AND NON-EXTRUDING FIBRE OR KAPCORK®.
- ASPHALT BOARDS: TONGUE AND GROOVE JOINTS; DUMMY JOINTS.
- PRESSTITE® COLD APPLIED JOINT SEALER #67.
- PRESSTITE® COLD POUR JET AIRFIELD JOINT SEALER #99.
- KAPCO® HOT POUR ASPHALT-RUBBER JOINT SEALING COMPOUND.
- KAPCO® HOT POUR JET AIRFIELD JOINT SEALER.
- KAPSEAL® CRACK FILLER.
- CONCRETE CURING COMPOUND.
- SUB-GRADE FELT . . . AND MANY, MANY MORE.

- **ONE COMPLETE BUYING SOURCE**
  No need to shop around when you can get all your wants in this giant supermarket of paving products. If you *use* it . . . we *have* it.
- **BIG SAVINGS IN MIXED-CARLOAD SHIPMENTS**
  Why carry a big inventory on low-need items? Stock only what you'll need—carry a more diversified stock—when you order under Presstite-Keystone's freight-saving "Mixed Carload Plan." Ask us about it.
- **ONE CONVENIENT INVENTORY & BILLING ACCOUNT**
  Less paper work, easier and faster handling, more net profits for you.
- **FAMOUS-NAME QUALITY**
  Two reliable names combine to bring you controlled quality, reliable delivery—and a personalized engineering service whenever you need it.

PRESSTITE Sealing Compounds — PRESSTITE-KEYSTONE ENGINEERING PRODUCTS COMPANY — KAP

A Division of AMERICAN-MARIETTA COMPANY
3782 CHOUTEAU AVENUE, ST. LOUIS 10, MISSOURI

. . . for more details circle 289, page 16

Headlines

New Streamlining for Bureau of Public Roads

The Bureau of Public Roads is undergoing a decentralization, planned to help speed up the highway program. A major transfer of operating authority from Washington to the field offices has been announced.

This "decentralization," according to the Federal Highway Administrator's office, is in line with the expressed desire of Congress and instructions of President Eisenhower that everything possible be done to expedite the Interstate highway program.

With the broader authority, the Bureau's field offices can take final action on many matters that in the past were referred to Washington for decision or approval.

The Headquarters office in Washington, and in turn the regional offices, will be largely concerned in the future with the uniform application and coordination throughout the country of the broad policies established by the Highway Administration and in research activities leading to improved highway design, construction and maintenance. Under the Administrator's new directive the Bureau of Public Roads district offices in each state will have authority to take final action on:

1. The detailed location of the highways on the 40,000-mile Interstate System network between the cities or towns which are the control points approved at Washington level.

2. All matters relating to the location of the 235,000 mile primary system and the secondary highway systems.

COVER SCENE

Setting overpass steel for one of the 235 structures on the Kansas Turnpike, summer of 1956. One of fifteen structures erected near Eldorado by United Contractors, of Des Moines, who held a prime contract. The crane is a Koehring 304. Steel for these jobs was fabricated by St. Joseph Structural Steel Co., of St. Joseph, Mo., and by Geo. Christofer, of Wichita.

Euclid Scrapers and Crawlers are your best investment

Overhung engine type Scrapers of 7, 12, 18 yds. struck capacity

Powered by engines of 143, 218 and 300 h.p., these scrapers have heaped capacities of 9, 16 and 25 yds. Advanced design of Euclid's hydraulic lever action, low bowl and 4 section cutting blade provides fast, easy loading. The 18 yd. model has Torqmatic Drive . . . all have NoSpin differential and Euclid planetary drive axle . . . unequalled accessibility of the power train and major components.

TC-12 Twin-Power Crawler

A completely new concept in tractor design and performance, this Euclid Crawler has two 218 h.p. engines for a total of 436 h.p. There is a separate Torqmatic Drive for each track. Top speed is 8 m.p.h. —change from one speed range to another or to one of the three reverse speeds is made under full power. Planetary drives can be serviced without removing track, frame or drive sprocket. Operating weight, bare, is 62,500 lbs.

Four-wheel Tractor Scrapers

These 12, 18 and 24 yd. scrapers have maximum stability for rough roads and high speed hauls. At 3:1 slope heaped capacities are 14, 20 and 27 yds. A 200 or 218 h.p. engine with 5-speed transmission powers the 12 yd. scraper . . . drive tires are 21.00 x 25 with 24.00 x 25 optional. The 18 yd. scraper has 300 h.p. with 3-speed Torqmatic Drive . . . standard tires are 24.00 x 25 with 29.5 x 25 optional . . . a 17 yd. bottom-dump is interchangeable with the scraper. The 24 yd. scraper has a 300 or 335 h.p. engine with 4-speed Torqmatic Drive and 27.00 x 33 tires . . . 33.5 x 33 drive tires are optional equipment.

Twin-Power "Euc" Scrapers

These scrapers have capacities, struck, of 18 and 24 yds. — heaped at 3:1 slope, 21 and 27 yds. Both models are powered by two engines, each with Torqmatic Drive, and have 27.00 x 33 tires with 33.5 x 33 optional. The Model TS-18 has a total of 436 h.p. Tractor of the Model TS-24 has a 300 h.p. engine—scraper wheels are driven by a 218 h.p. engine—a total of 518 h.p. "Twins" outperform other scrapers by a wide margin—they self-load and work under conditions that stop other scrapers.

Your Euclid Dealer will be glad to provide information on the complete line of "Euc" Rear-Dumps, Bottom-Dumps, Scrapers, and Crawler Tractors

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

new Highway 40 by-pass gets a sturdy "backbone" with LACLEDE WELDED WIRE FABRIC

OTHER LACLEDE
HIGHWAY STEELS ARE...

welded dowel spacers
multi-rib round reinforcing bars
center joints
recess joints
tie bars
accessories

MISSOURI HIGHWAY DEPARTMENT

GENERAL CONTRACTOR:
Cameron, Joyce and Company
Keokuk, Iowa

LACLEDE®

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

. . . for more details circle 259, page 16

Prescription for Profit...

EUCLID S-12 SCRAPER

with these pay-off advantages

- **CAPACITIES**
  12 cu. yds. struck . . . 14 yds. heaped 3:1 . . . 16 yds. at 1:1 slope.
- **EFFICIENT POWER**
  218 h.p. with 5-speed transmission is geared to working ranges . . . top speed loaded is over 21 m.p.h. for fast cycle time.
- **MORE TRACTION**
  Standard No-Spin differential eliminates wheel spin . . . 26.5 x 25 tires provide extra traction and capacity.
- **HYDRAULIC LEVER ACTION FOR SCRAPER OPERATIONS**
  Fast-acting, trouble-free . . . eliminates downtime and expense of cable replacement. All 4 hydraulic jacks are interchangeable.
- **MORE MANEUVERABILITY**
  Push-pull 90° full hydraulic steering for non-stop turns in 31 ft.
- **MORE EFFICIENT, LONG-LASTING CUTTING EDGE**
  Four sections are reversible and interchangeable for longer life . . . adjustable for most efficient loading in any scraper material.
- **LOWER MAINTENANCE COSTS**
  More on the job availability because major components are easily accessible . . . clutch and differential can be replaced in 1/3 the usual time for scrapers, transmission in 1/8 the time.
- **TOPS FOR DEPENDABILITY AND PERFORMANCE**
  Pay-off performance proved by contractor preference for "Eucs"... the fastest growing line of scrapers in the industry.

. . . for more details circle 321, page 16

See your Euclid dealer for more facts and figures and a production cost estimate on the S-12—you'll find that Euclids are your best investment.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

MORE VERSATILITY . . . 13 yd. (struck) Bottom-Dump is interchangeable with scraper bowl for flexibility to meet changing work requirements with minimum investment in equipment.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

because it fits more jobs...

the Cleveland 92 "Baby Digger" digs more trench ... in more places ... at less cost

THAT TREE LAWN is really *narrow* but the compact maneuverable 92 is doing a neat job of digging from driveway to driveway. The operator sets in and lifts out the digging wheel with speed and safety because the 92 gives him full job visibility and fast accurate boom hoist control. Synchronized wheel and conveyor speeds permit precision placement of spoil. No damage to curb, sidewalk or driveways either, thanks to the 92's perfect balance on long, smooth, non-clog crawlers—a real public relations asset.

★ Only 54" wide over crawlers
★ Digs 10" to 20" wide
★ Digs to 5' deep
★ Power-shift conveyor
★ Reversible discharge
★ Digs all soils
★ Digs in any weather
★ Portable, at legal limit speeds

THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

Good Everywhere

. . . for more details circle 228, page 16

Unspectacular Blast Does It

Spectacular blasts may be exciting to watch (and pictures of them may make dramatic illustration), but generally the most efficient shot is the quiet, least noticeable one, which expends its energy breaking rock rather than spewing debris about the countryside. In fact, in the congested eastern half of the country the quiet, controlled blast has become virtually mandatory in order to protect people and property.

Excavation for the relocation of U.S. 15 near White Deer, Pa., along the west bank of the Susquehanna River south of Williamsport, calls for just this kind of controlled shooting. Here the highway hangs on the river bank, parallel to and less than 50 ft. above a busy double-track railroad. Problem facing the Central Pennsylvania Quarry, Stripping & Construction Co., who subcontracted the excavation from the Middle Creek Construction Co.: to cut through the shale and sandstone formations without damaging the adjacent tracks or interrupting railroad traffic.

Central Penn's superintendent, Floyd Coveney, found "controlled blasting" to be the solution. By detonating each charge deep in the hole and using adequate stemming, he confines blast energy and minimizes throw while securing the required fragmentation. Employment of millisecond delay electric blasting caps adds to control of throw.

The sequence photographs show a typical side-hill shot on the relocation project. Three rows of eleven 6-in. holes were drilled parallel to the face of the cut. Spacing and burden were each 15 ft., and a 17-ft. depth of hole insured pulling the 14 ft. depth to grade. Each hole contained one 5 x 25 in. cartridge of Atlas 40 percent Giant Gelatin primed with a millisecond delay cap and topped by 14 ft. of stemming. Powder factor was 0.3 lb. per cu. yd.

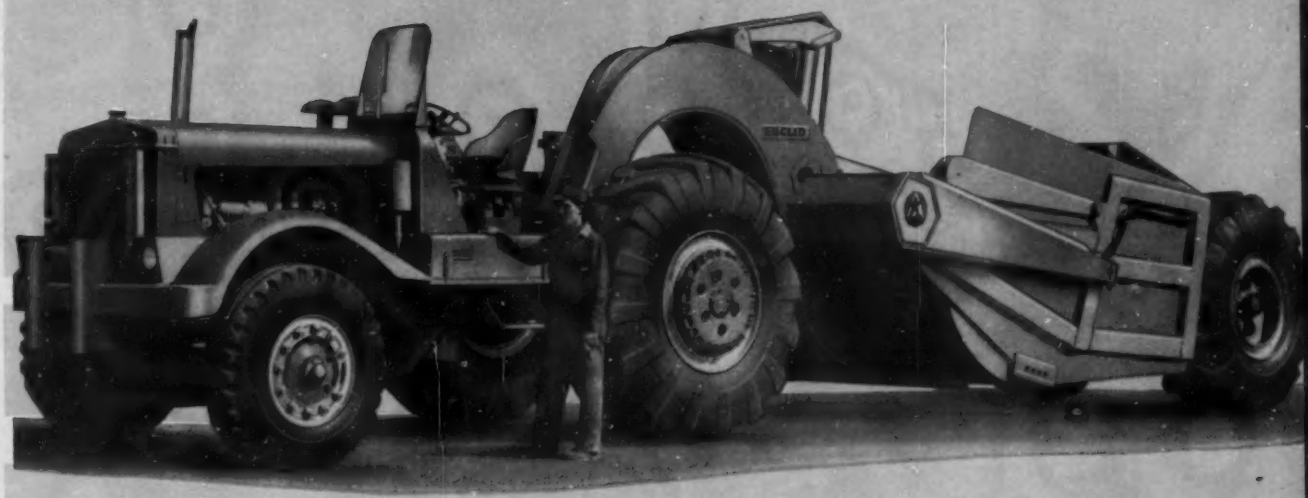
In this blast No. 1 Rockmaster caps, affording a .008 second delay, detonated the center row of holes. No. 2 Rockmasters primed the row farthest from the free face, providing a .025 second delay. The longest delay caps, No. 3's giving a .050 second delay, fired the row closest to the railroad.

As can be seen from the photo-

(Continued on page 36)

Here's the NEW *SS-24* "EUC" SCRAPER

32 Yards HEAPED!



Increased Production for high speed, long haul jobs

Euclid's new Model SS-24 has a struck capacity of 24 cu. yds. . . . carries up to 31 yards heaped at 1:1 slope . . . is available with either a 300 h.p. or 335 h.p. engine.

New Allison Torqmatic Drive with four speed ranges provides plenty of torque in lower ranges to meet the requirements of heavy loading and soft fills, yet permits high travel speeds for fast hauls. Shifting under full power without loss of momentum reduces cycle time.

Six wheel design of this SS-24 gives it exceptional stability for long fast hauls. It is equipped with rugged, job-proved Euclid planetary drive axle and 27.00 x 33 drive and scraper tires (33.5 x 33 are optional). Euclid hydraulic lever control of all scraper operations eliminates down-time and expense resulting from cable breakage. The cutting blade's four sections are interchangeable and reversible, providing straight and drop-center arrangements and longer blade life in any material.

See your Euclid dealer for more information on this big new scraper and the complete line of Euclid earthmovers . . . he can show you why ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

. . . for more details circle 321, page 16

(Continued from page 34)

graphs, taken at ⅕ second intervals during the shot, the blast looked unspectacular, but control was positive. There is no evidence of flying rock, escaping gas or lost energy. Only indication of violence is dust raised by displaced rock. Despite the relatively low powder factor, breakage was good because the energy remained confined. The rock was shaken and broken virtually in place.

The extent of control over throw is shown in Figure 4 where a dozer is clearing fractured rock from the old roadway above the railroad, which can be seen (below and behind the trees) to be unobstructed. Excellence of breakage is shown by the camera.

More engineers are joining labor unions

Nearly 60,000 of the nation's 500,000 professional engineers hold union cards today according to a summary by A. H. Raskin, published in the New York Times.

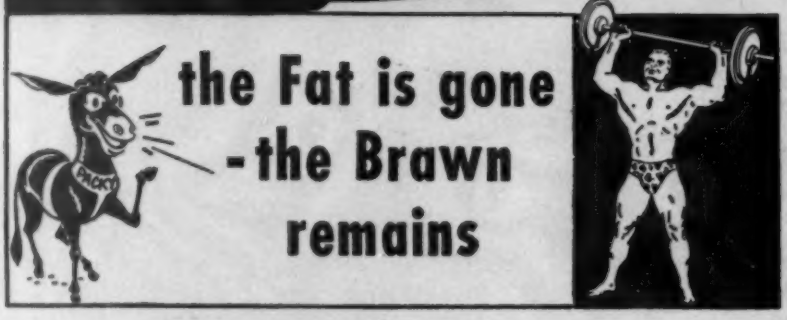
These figures are from a survey made public by the National Industrial Conference Board. This private research agency cited discontent over salaries and professional status and the disappearance of individual relations between engineers and their employers, as the principal causes for the spread of unionization.

Particularly important aspects are: (1) Narrowing of the spread between professional engineer and wage-earner pay rates and fringe benefits; (2) lack of raises for older men in engineering positions; (3) blatant Help Wanted ads in certain industries offering spectacular job inducements.

The report showed that the average earning of production workers has tripled since 1929, while the income of engineers has only doubled. The median salary for professional engineers with ten years' experience is estimated today at $7,850 per year.

A generation ago, an engineer could expect to triple his salary at the end of ten years out of college, whereas today the big pay offered young engineers has narrowed this margin.

The engineer, according to this report, wants to be classified as part of the management team but many companies keep them out of management. Some engineers complain that they were assigned to draftmen's work and others deplored the faultiness of a communications channel between top management and the lower echelon of engineers.



Judicious use of alloy steel, to produce a lightweight trailer with more than adequate strength is a Rogers accomplishment in the popular LT Model.

Attractively priced, it meets the demand for more payload per pound of trailer weight.

Available in 15, 20, 25, 30 and 35 ton capacities; it is similar in general design and equipment to Rogers standard models.

*One of several Rogers *TILT-DECK Rogers trailers.*

*Trademark Registered

Experience Builds 'em ROGERS Performance Sells 'em

ROGERS
LOW BED — HEAVY DUTY
TRAILERS
ROGERS BROS. CORP. ALBION, PENNA.

Export Office: 50 CHURCH ST., NEW YORK 7, N.Y., U.S.A. *Cable Address:* Brosites

. . . for more details circle 292, page 16

VERSATILITY... HIGH PRODUCTION

... all in one low-cost team

Here it is—the Allis-Chalmers HD-6 crawler tractor (63 belt hp) and the Model 44 scraper (4 yd struck, 4.7 yd heaped). This self-loading combination is a natural for many contractors . . . big enough to move dirt fast, small enough to leave room for profit on low-yardage jobs.

In addition to low first cost, the HD-6 has dozens of features that help keep operating costs down . . . including, 1,000-hour lube intervals for truck wheels, idlers and support rollers.

Full hydraulic control speeds jobs, simplifies operator's work. And the Model 44 scraper has these important big-scraper advantages: high apron lift, forced ejection, wide cutting edge, high flotation tires and ample clearance.

For all the facts on this low-cost tractor-scraper combination, see your nearby Allis-Chalmers construction machinery dealer now. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

. . . for more details circle 201, page 16

ALLIS-CHALMERS *Engineering in Action*

REO "BIG V" HAULS

Scaling 117,000 GCW*, Reo A-733 Carries Huge D9 on Long Hauls for Michigan Tractor and Machinery Co.

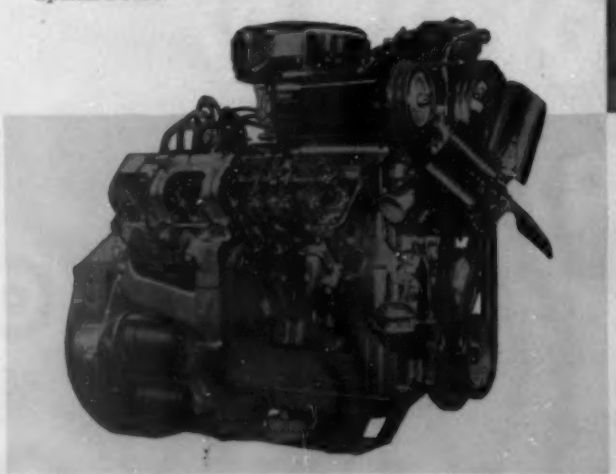
Rolling big loads like this is routine work for Reo's rugged "Big V's" in the construction field. That's because Reo Tandems are 100% truck built and powered to bear up under punishing performance on or off the highway.

Reo's giant 235 h.p. Gold Comet V-8 engines—with their advanced type short-stroke, wet-sleeve construction—deliver more pulling power to the wheels where power really counts . . . *in getting big loads quickly underway . . . and keeping them rolling smoothly on schedules that pay off in more trips per day.*

When you buy Reo trucks you don't gamble on engine performance . . . you buy proved performance—*backed by Reo's own 100,000 mile or 1 year warranty.* No other truck manufacturer offers you such positive assurance of quality and long life.

Reos range from 16,000 GVW to 78,000 GCW. Custom engineered to the job. For the Reo "Big V" that's best for your job, see your Reo Factory Branch or Distributor today.

Special Permit



This 220 h.p. V-8, Reo A-733 tandem is owned and operated by Michigan Tractor and Machinery Company of Detroit and Grand Rapids. As lower Michigan's exclusive Caterpillar dealer, they rely on Reo power to move heavy construction equipment like the new 35 ton D9 Tractor all over the state.

Reo short-stroke, wet-sleeve Gold Comet engines range from 100 to 235 h.p., Gas or LP-Gas, Sixes or V-8s. Up to 35% more efficient than the industry average. Models also available with 175 h.p. Cummins Turbodiesels.

REO MOTORS, INC.

LANSING 20, MICHIGAN • TORONTO, ONTARIO

SUBSIDIARY OF BOHN ALUMINUM & BRASS CORPORATION

GIANT CAT D9 TRACTOR

The Bigger Your Load, the Bigger Your Pay

Behind a REO "BIG V"

"Payload-Engineered" Trucks and Tractors

. . . for more details circle 331, page 16

FOR FAST, ECONOMICAL HIGHWAY TEST CORES

The New Acker KR Shot Core Drill!

The new Acker KR SHOT CORE DRILL is especially designed for obtaining clean, unbroken highway test cores quickly, inexpensively—accurately.

For economy, inexpensive steel shot does the cutting, reducing bit servicing and operational expenses.

Improved Acker design assures clean-cut core recovery up to 20" in diameter even from steel reinforced concrete.

Get the facts today—ask for Bulletin 19 R & S.

The Acker KR mounts on truck, trailer or drag. Power can be gasoline, kerosene, diesel, electric or air motor.

ACKER DRILL CO., INC.
SCRANTON 3, PA.

Manufacturers of diamond and shot core drills and supplies.

. . . for more details circle 197, page 16

Get Ready for Spring Patching with the NEW & IMPROVED . . .

Model 30-R
HEAT-A-MIX
TAILGATE ASPHALT MIXER

- For heating and remixing stockpiled asphalt.
- Can be operated in forward and reverse.
- No fire in pugmill—asphalt made hot and workable by indirect heat.
- Has its own gasoline engine and propane or kerosene heating system.
- Mounts quickly and easily on truck tailgate.
- Removable and adjustable legs make it easy to transfer unit from one truck to another without use of crane or hoist.

Get Complete Information
Send for Free Catalog

NAME_____
ADDRESS_____
STATE_____

WYLIE MANUFACTURING CO., INC.
Box 7086 (Zone 12) Okla. City

. . . for more details circle 340, page 16

Personals

Charles M. Noble Appointed Ohio Highway Director

Captain Charles M. Noble, who has won an international reputation as Chief Engineer for the New Jersey Turnpike during its construction period, has retired from that position and is appointed director of the Ohio Department of Highways.

In his new position, he reportedly will receive a salary of $30,000 per year, making him the highest paid state highway official.

Captain Noble's background embraces a wealth of accomplishments. Following World War II, after resuming for a brief period as chief engineer with the New Jersey State Highway Department, he took on the New Jersey Turnpike job in 1949, and subsequently supervised over $400,000,000 in new construction for the pike.

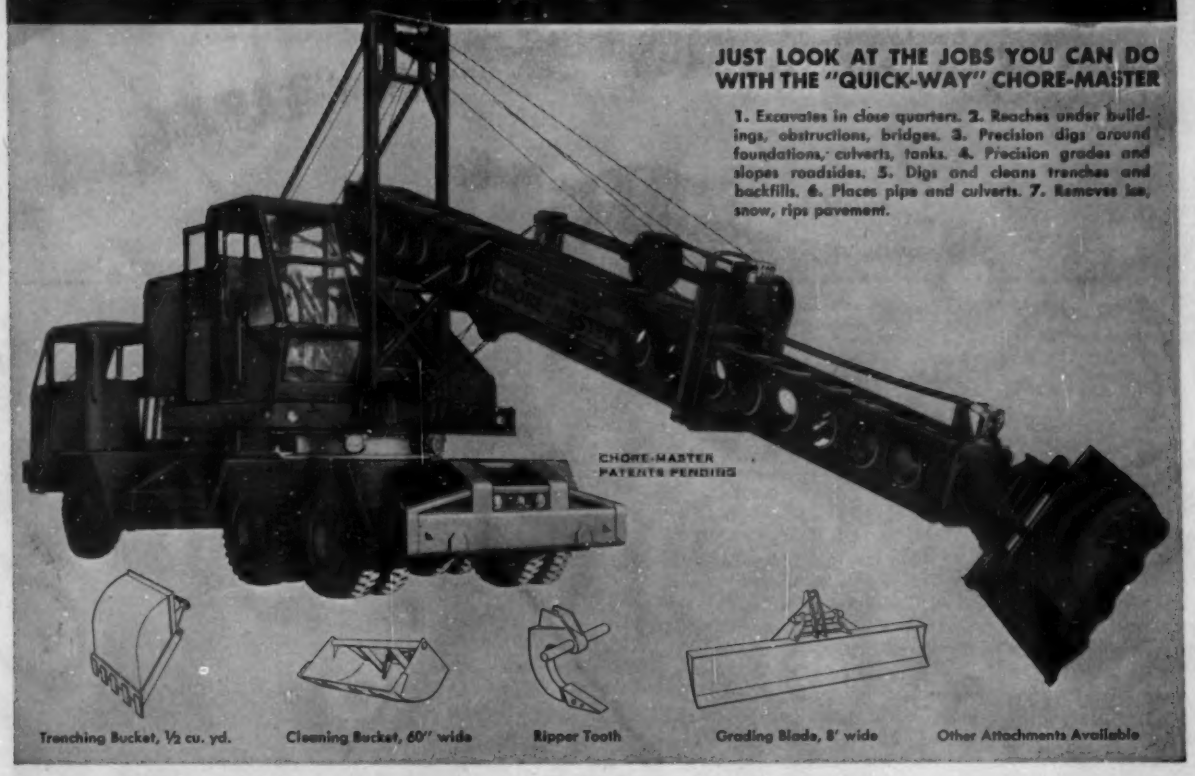
Before the war, Captain Noble's experience in engineering included work in seven states. And for thirteen years, he was engineer with the Port of New York Authority on projects totalling $150,000,000.

His military service included both World Wars. During the last war, he was a Commander, later promoted to Captain of the Civil Engineer Corps where he commanded the 22nd U.S. Naval Construction Battalion and the 6th U.S. Naval Construction Regiment for eighteen months in Alaska and the Aleutians.

Charles M. Noble

For the first time . . . an all-purpose hydraulic attachment for crane shovels!

The new "QUICK-WAY" CHORE-MASTER!



JUST LOOK AT THE JOBS YOU CAN DO WITH THE "QUICK-WAY" CHORE-MASTER

1. Excavates in close quarters. 2. Reaches under buildings, obstructions, bridges. 3. Precision digs around foundations, culverts, tanks. 4. Precision grades and slopes roadsides. 5. Digs and cleans trenches and backfills. 6. Places pipe and culverts. 7. Removes ice, snow, rips pavement.

Trenching Bucket, ½ cu. yd. | Cleaning Bucket, 60" wide | Ripper Tooth | Grading Blade, 8' wide | Other Attachments Available

The new "QUICK-WAY" Chore-Master is the first interchangeable hydraulic grading-digging attachment that makes dozens of jobs possible with one attachment. Now with the new Chore-Master, five crane shovel models, and the most complete standard line of attachments, "QUICK-WAY" is the most versatile machine you can own.

Two large hydraulic cylinders and one hydraulic motor operate the reaching, digging and swivel action of the boom and bucket. A single control lever guides all these actions with a simple twist of the wrist for sure, precision, hydraulic control.

This new attachment can be changed quickly to any of the other "QUICK-WAY" standard attachments.

Now a "QUICK-WAY" is the most versatile machine you can own—with MORE ATTACHMENTS to handle MORE JOBS with greater profits:

CHORE-MASTER • PILE DRIVER • DRAGLINE
CLAMSHELL • CRANE • MAGNET
TRENCH HOE • SHOVEL

MANY OTHER SPECIAL TOOLS ARE AVAILABLE

NOW! 5 "QUICK-WAY" MODELS WITH MORE BIG SHOVEL FEATURES:

125A—6/10 yd.—12½ Ton 105A—5/10 yd.—10½ Ton
85A—4/10 yd.—8½ Ton

85AC Crawler 105AC Crawler

"QUICK-WAY" TRUCK SHOVEL CO.
A Subsidiary Denver, Colo.

"QUICK-WAY" TRUCK SHOVEL CO. Dept. 287
2401 East 40th Ave.,
Denver 5, Colorado, U.S.A.

Please send me the following "QUICK-WAY" catalogs:

☐ Chore-Master ☐ 125A
☐ 85A ☐ 85AC Crawler
☐ 105A ☐ 105AC Crawler

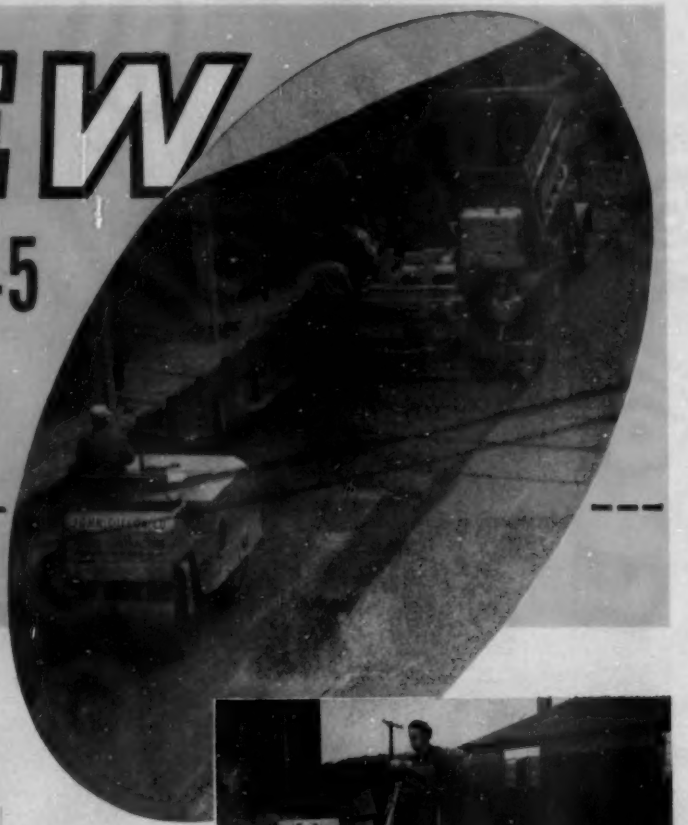
Name.....
Title.....
Company.....
Address.....
City and State.....

. . . for more details circle 290, page 16

NEW

BLAW-KNOX PF-45 Black Top Paver

gives you proved performance

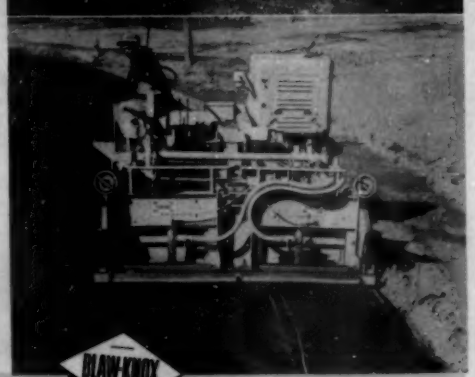


Chicago Freight Yard. Limited clearance next to this loading dock would be a problem for other pavers but not for the PF-45. This smooth paving is laid over rough cobblestones.

Many hours of production on all types of small to medium size black top paving jobs in several cities have proved the profit potential of the Blaw-Knox Model PF-45. On numerous jobs where the PF-45 had to work in confined areas such as school yards, driveways and around freight loading docks its speed and maneuverability made fast work of what would ordinarily have been slow and costly hand spreading. Contractors who have used this Black Top Paver like its combination of self-power and its 4-ton hopper that allows it to work in tight areas. They also like its power to push big trucks and to give high travel speed which eliminates the need for trailoring the machine on short between-job-moves.

The combination of low investment and low operating cost assures owners of big savings on every small to medium paving job. The Blaw-Knox Model PF-45 incorporates many of the economy features of its big brother, the Model PF-90 which is designed for the larger paving jobs. Most important of these features is the combined rubber tire-mounting and floating screed action which eliminates deflection in paving surface. Plan on these economies on your paving jobs this season.

Pittsburgh Housing Area. An areaway and playground would have had to be paved by hand since it required maneuvering in narrow driveways without damaging lawns and shrubs.



Cleveland Streets. On this job the Model PF-45 proved it could handle street paving as well as work in confined areas.

For complete information see Bulletin No. 2539. You can get it from your nearest Blaw-Knox Distributor or by writing direct to Blaw-Knox Company.

BLAW-KNOX COMPANY

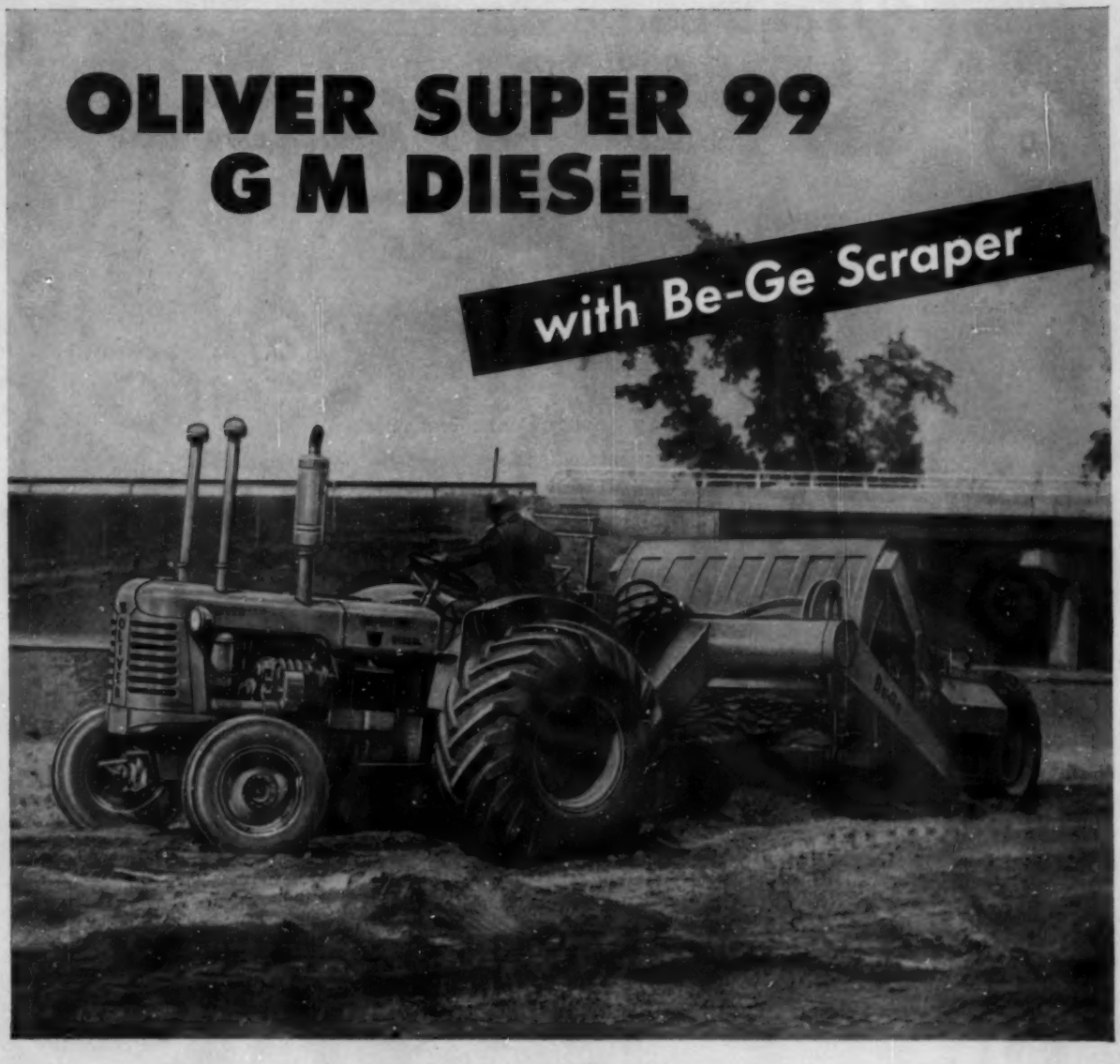
Construction Equipment Division

44 Charleston Ave., Mattoon, Illinois

. . . for more details circle 210, page 16

OLIVER SUPER 99 G M DIESEL

with Be-Ge Scraper



—the low-cost road rig of budget-stretching job range!

It's like having a bonus in the budget when you're job-set with this versatile pair. They're the ideal team for your kind of jobs... built to handle a bigger share of your road building, improving and maintenance work. You get practical road size with just-right capacity. You travel to the work quicker, write "finished" faster.

The Super 99 is powered with the field-proved GM industrial 3-cylinder diesel. Coupled with selective 6-speed transmission (torque converter optional), this power package delivers the means to get fast, full scraper loads in a hurry—at amazingly low cost, in fuel and servicing.

The Oliver Be-Ge Scraper is fully hydraulic, with full 6.7 yards capacity. More effective loading action results from advanced blade-and-bowl design that takes the stubbornness out of earth, sand and clay pay loads. Rapid ejection further speeds the round trip... adds more yardage per hour. Use it for scraping, hauling, digging, grading, backfilling... and countless more jobs.

The Oliver Super 99 also mounts loader, handles other drawbar attachments. See your Oliver Distributor.

NEW...

...this well-illustrated catalog covers the Oliver Super 99 GM diesel tractor from A to Z. With it we will include informative literature on the scraper matched to the tractor. Write for Bulletins A-951 and 531.

OLIVER

THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors and matched allied equipment

. . . for more details circle 283, page 16

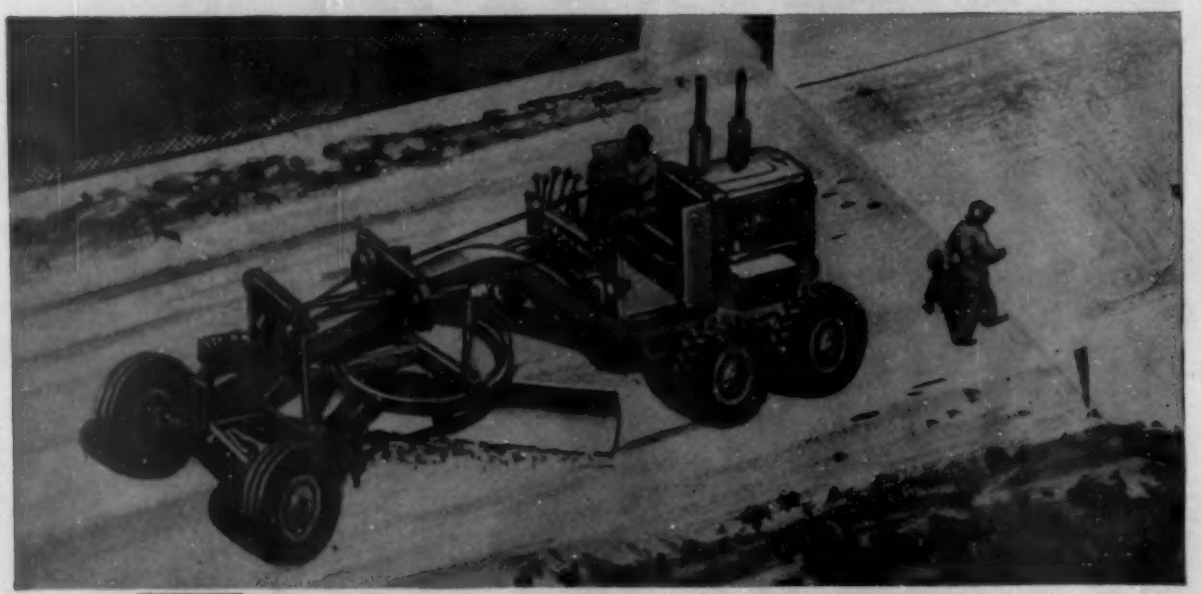
for road bed preparation it's...

CF&I CUTTING EDGES

. . . for scrapers, graders, dozers, and allied equipment.

CF&I Cutting Edges have an unmatched reputation with the Nation's roadbuilders. And for good reasons, too! Every CF&I Cutting Edge is carefully made from special analysis steel that's chosen for its resistance to abrasion and fatigue, then scientifically hot rolled, punched and inspected to make sure it's perfect.

For all earth-moving jobs—especially the tough ones—you'll find it profitable to choose CF&I Cutting Edges. What's more, they are available in a wide variety of lengths, widths, thicknesses, and hole spacings . . . flat or curved, with beveled or square ends, and in different finishes.



CF&I CUTTING EDGES

THE COLORADO FUEL AND IRON CORPORATION

4481

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth Houston • Kansas City • Lincoln (Neb.) • Los Angeles • New Orleans • New York • Oakland • Oklahoma City • Philadelphia • Phoenix Portland • Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita CF&I OFFICES IN CANADA: Toronto • Montreal

. . . for more details circle 230, page 16

Proven construction worker available

HAS FOUR-YARD SHOVEL . . . WILL TRAVEL

. . . for more details circle 199, page 16

Will travel . . . there's the key to the real value of an Allis-Chalmers HD-21G tractor shovel. It not only digs and loads four yards at a pass, it is mobile enough to work in all parts of the excavation . . . and flexible enough to do many different jobs well.

Besides loading trucks, the HD-21G can help maintain haul roads, carry material to stockpiles, clean up stray rock, or even travel ahead of the job to clear land.

Let your Allis-Chalmers dealer show you the many ways an HD-21G can work profitably for you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

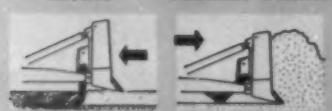
FASTER
"2 WAY" DOZING
with
PRECO
Back-Rippers

Because these rugged Back-Rippers break up the ground while the tractor is backing up — thus permitting the blade to make a full load faster on the forward trip — they give you double advantage.

Preco Back-Rippers make every dozing job easier — they pull out rocks and roots. Steep banks can be raked down quickly and road building is speeded up as the Rippers tear out boulders, ledge rock and hard material.

FOR . . . Building Pioneer Roads
Clearing Land and Rights-of-way
Gravel Pit Operations
Slate Breaking in Strip Mines
Logging
Mounted on Pusher Tractor for Faster Scraper Loading.

BACK UP RIPPING — EASIER FORWARD DOZING



Preco Back-Rippers are completely automatic in operation — they dig in on the back-up trip and ride on the surface when going forward. There are no controls and, when desired, they can be locked up out of the way.

See your Caterpillar Dealer or send the coupon for information.

PRECO INCORPORATED
8300 E. Slauson Avenue
Los Angeles 22, Calif.

Please send information on Preco Back-Rippers

Name_____

Address_____

. . . for more details circle 288, page 16

Personals

(Continued from page 40)

CARLOS D. BULLOCK has joined Burgwin & Martin, consulting engineers of Topeka, Kansas, as head of the firm's Structure and Bridge Department.

Mr. Bullock was formerly Regional Structural Engineer with the Portland Cement Association at Kansas City.

Carlos D. Bullock

ROBERT O. ASHBACH of Ashbach Construction Company, St. Paul, is the new president of Associated General Contractors of Minnesota. B. K. Soby of John Dieseth Company, Fergus Falls, is vice-president of the Highway Division for 1957, elections occurring at the recent three-day convention attended by 650 members and visitors.

LYNN R. BRODRICK, former state highway commission member was appointed Director of the Kansas Highway Commission. He succeeds Frank E. Harwi, Jr., who has taken a Federal appointment.

MILFORD N. BROWN, superintendent of Wayne County Road Commission in Detroit for more than 20 years, died recently at the age of 58. He had charge of upkeep of one of the most extensive and heavily traveled county road systems in America.

MAXWELL W. FISHER, engineer of maintenance, Wisconsin state highway commission, died recently at the age of 50. He was a 28-year man with the organization, and headed the maintenance department since 1950,

Maxwell W. Fisher

and was active on Highway Research Board and the AASHO committees, having been chairman of the Department of Maintenance of the Board.

FRANCIS E. TWISS, formerly director of engineering, International Road Federation, has been appointed engineer advisor at AGC. DONALD A. BUZZELL, assistant manager of the Heavy Construction and Railroad Contractors' Division, has been given additional responsibilities.

H. E. FOREMAN has retired as managing director of the Associated General Contractors of America after 16 years of continuous service in that position. In regretfully accepting his retirement request, the AGC management named Foreman advisor.

"Doc" Foreman steered the Association through the war period during which the membership mobilized for defense and began a growth from the then 2500 member firms to the present 6700 firms. The headquarters staff more than doubled in the period of Foreman's leadership.

James D. Marshall who has been executive director since 1953, in April of 1956 also assumed full responsibility and authority as chief executive of the Association's management.

HAROLD L. AITKEN, former state engineer of Nebraska and until recently the executive assistant administrator, Federal Civil Defense Administration, will head the new Washington office of The Clarkeson Engineering Company, Inc., of Boston.

DR. FRED D. ORDWAY, JR. is appointed director of the Portland Cement Association Fellowship at the National Bureau of Standards, Washington, D.C. The Fellowship is part of the Research Department of PCA and employs a staff of scientists in the laboratories of the Bureau.

B.F.Goodrich

B. F. Goodrich All-Nylon tires average 3,000 hours' service on Florida Turnpike

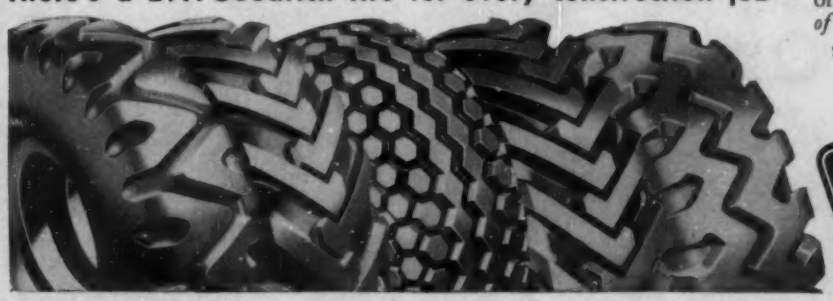
THE unit above is one of a hundred operated by the Ralph E. Mills Company on the Florida State Turnpike. This contractor builds roads all over the world, owns numerous vehicles. Here the job is grading and filling. 25-ton loads of earth must be moved through soft, sandy soil—work that calls for real traction.

That is why the company uses B.F.Goodrich *all-nylon* Super Traction tires, finds they work as many as 3,000 hours, thanks in part to the superb on-the-job service the local B.F.Goodrich dealer gives. Super Traction cleats are thick and widely spaced to take a deep bite into the soil and give you positive traction. Yet the tread is wide for maximum flotation in soft, sandy soil.

Under the tread is the B.F.Goodrich *all-nylon* cord body. It withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. The *all-nylon* Super Traction body outwears even the extra-thick tread, *can be retreaded over and over.*

Your B.F.Goodrich dealer has a complete line (left) of money-saving tires for your construction work. See him today or write *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

There's a B. F. Goodrich tire for every construction job



Specify B. F. Goodrich tires when ordering new equipment

B.F.Goodrich
FIRST IN RUBBER

Your B. F. Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

. . . for more details circle 245, page 16

UNIT
MODEL 510

THE NEW **UNIT**
Challenger
. . . as a **DRAGLINE**

NOTHING BUT THE BEST! There's no substitute in the ⅜-yard excavator field for EXPERIENCE. UNIT has it! UNIT knows what you need in a ⅜-yard machine . . . knows how to engineer the power, over-all performance-superiority and economy of operation for the jobs you want to do profitably with a ⅜-yard dragline, clamshell, crane or trenchoe. The New UNIT CHALLENGER proves this with such features as: **Self-aligning Hook Shoes . . . Force Feed Lubrication . . . Full Floating Trunnion-Mounted Tapered Drums . . . Torque Converter, etc.**

See the many other new features illustrated and described in UNIT CHALLENGER Bulletin C-800. Write for your copy of this bulletin.

UNIT CRANE & SHOVEL CORP.
6407 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

Geared to boost your earnings!

. . . for more details circle 309, page 16

New Publications

Standard Plans for Highway Bridge Superstructures

An entirely new edition of standard plans for highway bridge superstructures has been issued by the Bureau of Public Roads. In announcing these plans, Federal Highway Administrator John A. Volpe said, "As we launch the greatest highway construction program in history, with engineering staffs limited and hard-pressed, this book should prove of inestimable value. It represents another contribution of the Bureau to aid highway officials in stepping up engineering through technical developments and time-saving methods."

The 52-page book comprises 18 series of standard plans which furnish details for a variety of types of superstructures. Entirely new in this edition are three series for pretensioned precast concrete and five series for structural timber. From the previous (1953) edition, with revised and modernized designs, are series for I-beams, riveted or welded plate girders, reinforced concrete slabs, T-beams, and box girders, precast concrete decks, and post-tensioned precast I-sections.

The plans will serve as a useful guide to state, county and local highway departments in the development of suitable and economical bridge designs for primary, secondary, and urban highways. The drawings give sufficiently complete information so that they approach contract drawings in detail.

The designs are based on two widths of roadway: 24 ft. with H15-44 live load and 25 ft. with H20-S16-44 live load. The ranges in span lengths, from 11 to 140 ft., are based on the economy and suitability of each particular type of superstructure.

"Standard Plans for Highway Bridge Superstructures" (1956 edition) is available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C., at $1.75 per copy.

BUREAU OF PUBLIC ROADS, ANNUAL REPORT for 1956 fiscal year. Price 25c. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Contains summary and statistical

(Continued on page 52)

Cut new road through Carolina mountains

New, big-capacity 18-yd. Fullpak Scraper (left foreground) heaps capacity load, then swings around in 90° turn to head for fill, on North Carolina roadbuilding job. Older Model "C", in background, also carries heaped load.

To make a better, safer road out of U.S. Highway 52, near Norwood, N.C., Blankenship Brothers, Charlotte, moved 264,000 yards of tough clay and shale.

For this State Highway and Public Works Commission project, Blankenship drove in a fleet of LeTourneau-Westinghouse Tournapull-Scrapers that included one 18-yd. C Fullpak, two 16-yd. "C's", one Super C . . . plus 2 tractor-drawn LP Scrapers.

According to co-owner Ben M. Blankenship, Tournapulls were a major factor in putting dirtmoving ahead of the 270 working-day schedule.

Fullpak loads shale in 1 min.

Building this 1.85-mile section of roadway called for daylighting curves, grading, finishing, and bringing in 14" of stone base and asphalt for the new 24' wide road.

Although rain hampered operations, Blankenship's fleet worked continuously. Tournapulls easily excavated and hauled the tough-loading shale and clay. At time photographs were taken, Fullpak was heaping a load of shale over 50 to 75' in about 1 min. . . . hauled 770' downhill in 50 sec. On the far downward slope, rig spread 165' in 16 sec. . . . returned 1115' via portion of old highway in 1 min., 41 sec. . . . completed 2100' round-trip cycle in average of 3 min., 53 sec. Comparable competitive scrapers took 18% more time . . . were averaging 4 min., 35 sec. for the same cycle.

Fullpak . . . "easiest to operate"

Blankenship was very pleased with Fullpak's performance on this operation. He said, "These 'Pulls are easiest scrapers in the fleet to operate, by far. The new Fullpak loads fast." Foreman and Superintendent Banks Massey agreed with Blankenship as he said, "I sure like that new Fullpak. It's better and faster."

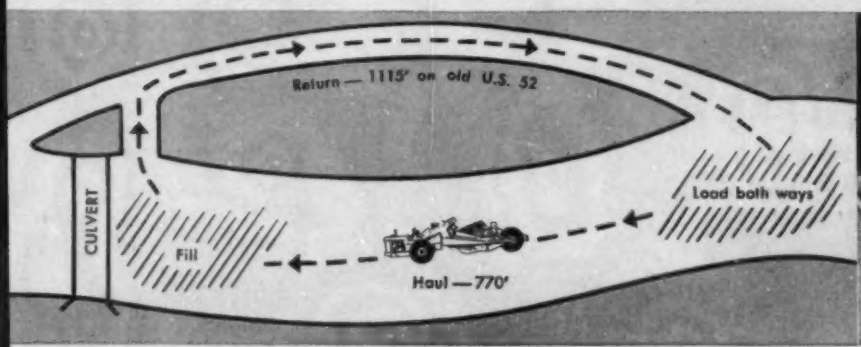
Travel job-to-job at speeds to 30 mph

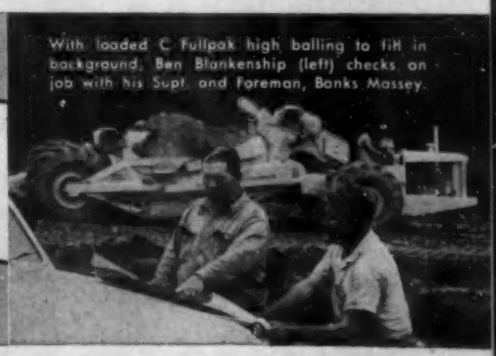
In addition to providing profitable production dirtmoving, Fullpak saved travel time and money for Blankenship Bros. Operator drove machine from Charlotte to the job site at Norwood . . . a distance of 65 miles . . . in a little over 3 hours. Machine traveled right along with regular traffic, at speeds to 30 mph. Big, low-pressure tires rolled over blacktop or new concrete without damage to pavement. Roading rig eliminated trouble and expense of truck and trailer.

Move more yards at less cost

To help you speed your jobs, check into this big-output, money-making C Fullpak Tournapull. Equipped with a new, low, wide, easy-to-load bowl, "C" heaps big pay yards faster, boils better . . . reduces your cycle time and operating costs. Call or write us for complete details.

Fullpak—Trademark, Tournapull—Trademark Reg.U.S.Pat.Off. F-1130-H-b





With loaded C Fullpak high balling to fill in background, Ben Blankenship (left) checks on job with his Supt. and Foreman, Banks Massey.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

. . . for more details circle 261, page 16

WHERE QUALITY IS A HABIT

An Impressive Example from Washington State—
REYNOLDS ALUMINUM BRIDGE RAILINGS
2,288 FT. OVERCROSSING AT AUBURN, WASH.
Gen'l Contractor:
Anderson Bridge Construction Co., Tacoma

Wherever America's modern roads go up and over, modern specifications call for Aluminum. Rustproof and corrosion-resistant, it never needs painting. It is strong yet light to handle—cutting installation cost. It looks modern, too—permitting new design flexibility. Reynolds supplies cut posts and railing extrusions in many designs, including Standard Pipe as shown here. Call the nearest Reynolds Sales Office listed under "Aluminum" in Classified Telephone Directories. For Reynolds authoritative 52-page book "Bridge Railings", please write on your letterhead. **Reynolds Metals Company,** General Sales Office, Louisville 1, Kentucky.

Preferred everywhere... graceful, sturdy, rustproof Aluminum Lighting Standards.

Interlocking Extruded Panels for

REYNOLDS ALUMINUM SUPERHIGHWAY SIGNS

Interlocking joint designs make these panels go up fast, producing an extremely strong and rigid sign, hard to damage, but easy to repair. Write for booklet.

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

REYNOLDS ALUMINUM

See "CIRCUS BOY", Sundays, NBC-TV Network.

. . . for more details circle 328, page 16

"THE HARDEST, BLOCKIEST ROCK WE EVER ENCOUNTERED", is how foreman described 805,000 cu. yds. of dense mica schist excavated along a 3.8-mile section of Connecticut Turnpike. Up to 30,000 lbs. of explosives were used in a week to shoot 30,000 yds. of rock. Thirteen big compressors, 9 of them Jaeger "600's", supported four 2½ yd. shovels.

How Jaeger "600's" sped Turnpike rock job

Excavating in lifts averaging 15′, Slattery Contracting Co., Inc., Maspeth, N. Y., worked fast to move 805,000 cu. yds. of hard rock on the Connecticut Turnpike. The largest cut, 58′, was taken down in two lifts of 30′ and 28′. Drilling was done in three patterns: 8′x8′, 7½′x7½′ and 6′x6′— a lot of footage. To assure plenty of reserve air for "hurry-up" production, a typical drilling spread teamed two Jaeger "600" Rotaries with three 375 cfm track-mounted drills, providing 400 cfm of 100-lb. air per drill. In other combinations, three Jaeger "600's" powered three and sometimes four 450 cfm track-drills.

Operating at their characteristic slower speed, nine efficient Jaeger "600's" maintained top drilling production for long hours, including double shifts. Full load speed of the Jaeger "600" is only 1650 rpm (100 to 150 rpm slower than other "600" compressors using the same Model 6-71 GM diesel engine), which reduces fuel consumption and engine piston travel and saves up to 9000 compressor revolutions per hour.

Other Jaeger rotaries (125, 250 and 365 cfm) give you this same slow-speed, high-efficiency performance — 1700 rpm at full load instead of 1800 to 1950. See your Jaeger distributor, or write for Catalog JCR-5.

JAEGER "365" SPEEDS WORK, TOO: Drives 6 Thor #25 heavy duty breakers with full 100-lb. air wallop to finish job in a hurry at a busy Philadelphia traffic intersection. No "old standard 315" compressor has the capacity to do such a fast job. Putting out 50 cfm more air, the Jaeger "365" operates at a fuel-saving, compressor-saving 1700 rpm at full load — 100 rpm slower than any "315" unit.

THE JAEGER MACHINE COMPANY

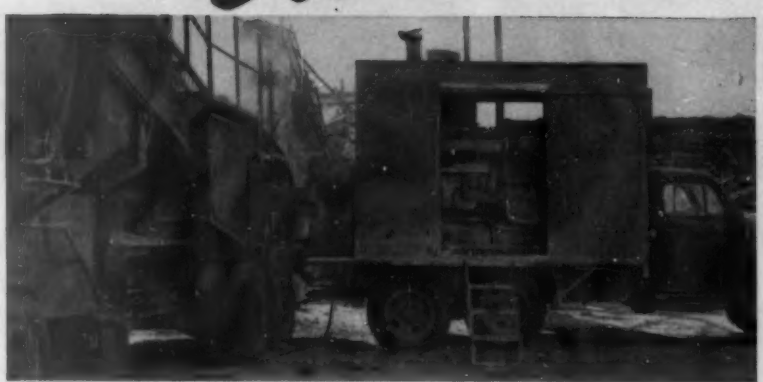
223 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS

. . . for more details circle 255, page 16

powering each portable crushing plant

WAUKESHA Diesels



● These two portable crushing plants, shown operating near Appleton, Wis., are *powered for production—with Waukesha Diesels.* Both plants and their crushers were built by Highway Machinery Corp., Waukesha, Wis. In the primary-crushing plant (above, right) the 3′ x 10′ Simplicity Vibrating Scalper-Feeder and conveyor are driven by the current from a Waukesha-powered 100 KW generator in the truck (above, center). The 25 x 36 Jaw Crusher is powered by a 148-DKU Waukesha Diesel. This 6-cyl., 5½ x 6-in., 779 cu. in., 155 max. hp unit handles every load demand eagerly and easily, with power to spare. The secondary-crushing plant (above, left) consists of a Double Jaw Crusher with twin 8 x 36 units, a 25″ x 40″ Roll Crusher, a 5′ x 12′ Simplicity double deck Sizing Screen, and conveyors. Its separate, mobile Waukesha power plant is mounted in the truck (shown below) with a 100 KW Generator. This Waukesha NKDBSU Turbo-Supercharged Diesel—6-cyl., 7 x 8¼-in., 1905 cu. in., with counterbalanced crankshaft—drives the two crushers, and powers the generator which supplies current for all incidental equipment. A rugged, compact engine with lively acceleration, clean burning, prompt starting, great overall economy and smooth extra power up to 368 hp. Get Bulletins 1634, 1414.

330

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES

. . . for more details circle 317, page 16

New Publications

(Continued from page 48)

material of value to highway and municipal planners. This report reviews notable progress during the year in various areas of effort of the Bureau and contains statistical tables on road mileages, expenditures, project status, etc.

HIGHWAY ENGINEERING TRAINING PROGRAMS. Chapters on suggested training programs for graduate engineers, how state highway departments are doing their training and other topics.

Compiled by the Committee on Education and Training of Highway Engineering Personnel, Ellis Danner, Chairman. Issued as special report 24, Highway Research Board, 2101 Constitution Avenue, Washington, D. C.

HIGHWAY TRANSPORTATION LEGISLATION IN 1956. A summary of Federal and state legislative activity, compiled by National Highway Users Conference, National Press Building, Washington 4, D. C. Available on request to NHUC Legislative Reporting Department, Miles W. English, Mgr.

UTILIZATION OF HIGHWAY ENGINEERING MANPOWER. Nine papers in a symposium on this subject, given at the Highway Research Board meeting January 1956. Containing a wealth of data, papers combined as Bulletin 134. Price $2.20 remitted to the Highway Research Board, 2101 Constitution Avenue, Washington, D. C.

Ultimate Strength Design of Reinforced Concrete

The American Concrete Institute has reprinted in special covers the report "Guide for Ultimate Strength Design of Reinforced Concrete," by Charles S. Whitney and Edward Cohen. The report first appeared in the November 1956 ACI Journal. The 36-page report (including 15 design charts) in 6 x 9-in. format is priced at 75 cents each.

This paper is intended to serve as a supplement to the ACI Building Code (ACI 318-56) which permits the use of the ultimate strength method for the design of

(Continued on page 56)

CLIPPER *Sells* MORE...
Because CLIPPER *Sells* QUALITY!

Clipper®
CONCRETE SAWS

Call Us For A FREE Demonstration By A Clipper Factory-Trained Representative

25 H. P. *Self-Propelled*

• Cut MORE Concrete at LOWER Cost!

Clipper's SIMPLE design... RUGGED construction... DEPENDABLE performance give you a fast powerful Concrete Saw for heavy production cutting on all concrete and asphalt jobs. EXCLUSIVE Clipper features include SELF-PROPELLED unit with ABRASIVE COATED DRIVE WHEELS and rear wheel drive for powerful forward thrust. POSITIVE SCREW FEED—a "Must" when using low-cost "Green-Con" Abrasive Blades to compensate for diminishing blade diameters. Protects valuable diamond blades from bumping and scraping. A Positive Control AT ALL TIMES!

MODEL
C-250

25 H. P. Gasoline Powered. Gasoline or Electric Models available from 1½ to 36 H.P.

CLIPPER BLADES for EVERY JOB

Use Genuine CLIPPER DIAMOND Blades for Cutting Cured or Green concrete and asphalt with any aggregate. CLIPPER "GREEN-CON" Abrasive Blades for cutting "green" Concrete. There is a Clipper Blade for ALL Your Jobs.

***Ask for* FREE**
DEMONSTRATION
TRIAL
on *Your* Job!

USE GENUINE CLIPPER BLADES—Diamond & Green-Con Abrasive

DIAMOND BLADES for any job—any aggregate—every saw! Choose your Clipper Diamond Blade from a wide variety of specifications to cut green or old concrete with outstanding speed and economy.

GREEN-CON ABRASIVE BLADES give you savings as high as 80%—with completely new series of "Green-Con" Reinforced Abrasive Blades that cut "Green concrete" with the widest possible range of HARD to SOFT Limestone Aggregates.

Clipper KANSAS CITY, MO.

Better Mail the Coupon NOW!

• Genuine Clipper Products are Sold Only Direct, from Factory Branches in Principal Cities, Coast to Coast. Consult Your Phone Book, or Mail Coupon for Same-Day Service.

CLIPPER MANUFACTURING CO.
2826 W. Warwick • Kansas City 8, Mo. 425X

- ☐ I want a FREE DEMONSTRATION of a Clipper Concrete Saw
- ☐ Send FREE literature on Clipper Masonry Saws and Blades
- ☐ Send FREE literature on Clipper Concrete Saws and Blades
- ☐ Have a Clipper factory trained representative call on me.

NAME_____

ADDRESS_____

CITY_____ STATE_____

. . . for more details circle 229, page 16

HUBER - the right equipment for

5D-190 — The world's most powerful motor grader (195 h.p.). Torque converter, tail-shaft governor and power-shift transmission.

6-D & 7-D Series — Four models in horsepower range of 102 to 150 h.p. Torque converter, tail-shaft governor and power-shift transmission.

Tandem Roller — Torque converter, tail-shaft governor and two-speed transmission. Models available include 5-8, 8-10, 8-12 and 10-14 ton variable weight.

3-5 Ton Tandem — Torque converter and water-cooled engine. Close curb clearance. Available with towing attachment and retractable wheels.

For a demonstration—see your nearest Huber-Warco distributor

Get all the facts—

If you desire more information on any of the Huber-Warco products shown, write today for free literature. Please specify type of equipment.

WARCO

all your grading and rolling jobs!

4-D Series — Five standard transmission models in a horsepower range of 75 to 123 h.p. Completely cab-controlled blade positioning.

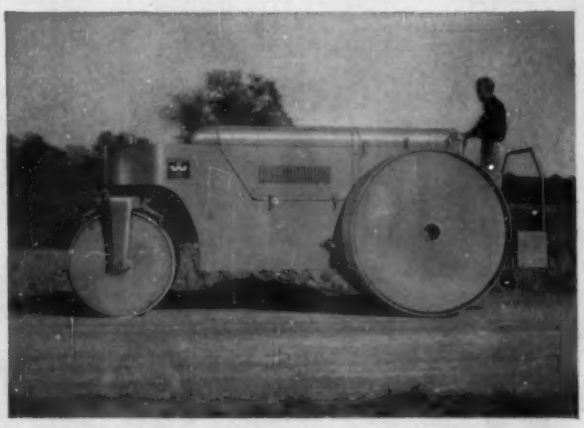
M-52 Maintainer — with torque converter. With hydraulically controlled attachments, machine can perform nine construction and maintenance jobs.

Why Huber Warco?

Huber-Warco Company and its predecessors, with over 195 years of combined experience, have been pioneers in the design and development of rollers and graders.

Beginning with the introduction of the world's first motor grader in 1921, other firsts include; producing the world's first automotive-type motor roller in 1923, the first hydraulically controlled motor grader in 1926, first to offer a grader with torque converter and power-shift transmission, as well as the world's most powerful motor grader in 1955.

Over 185 domestic and foreign distributors are strategically located to provide Huber-Warco customers with world-wide sales and service.



3-Wheel Roller — Torque converter, tail-shaft governor and two-speed transmission. Standard and variable weight models range from 10 to 14 tons.

HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

. . . for more details circle 250, page 16

(Continued from page 52)

reinforced concrete members. It presents the method in its simplest form with working equations and charts to aid in their application. It aims to give the designing engineer all the information that he needs for the use of the ultimate strength method in accordance with the recommendations of the report of the ACI-ASCE joint committee on ultimate design.

Regarding those problems not covered by the Code such as consideration of shear, bond and deflections, recommendations are made based on the writers' practice.

Enlargements of the design charts (12 x 12) are available *in sets only* at $2.00 per set.

COMPOSITION AND PROPERTIES OF CONCRETE. (McGraw-Hill civil engineering series.) By George E. Troxell and Harmer E. Davis, with chapters on proportioning of concrete mixes and strength of concrete by J. W. Kelly. 436 pages. Price $7.75. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. A practical and comprehensive textbook and manual on the art of concrete making, for working engineers and contractor personnel, as well as students.

Timber Construction

TIMBER DESIGN AND CONSTRUCTION HANDBOOK, 622 pages, cloth bound, price $12.75. Published by F. W. Dodge Corporation, 119 W. 40th St., New York 18, N. Y.

Prepared by Timber Engineering Company as a comprehensive design reference and practical field handbook, this new work offers all the essential information needed to develop better, more economic wood structures. It includes results of latest research by timber scientists.

This new handbook is organized into three main sections covering basic standards, design, and design standards.

The Timber Engineering Company, engineering and research affiliate of the National Lumber Manufacturers Association has prepared this handbook from its experience as a nonprofit service and development organization concerned with methods and uses for wood.

Time-saving Methods in Highway Engineering

The Highway Research Board has published 14 installments in a series of reports on time-saving procedures in highway work. Those interested should designate the subject to be covered and remit the following in ordering copies:

(1) Administration $0.15; (2) Planning $0.90; (3) Location $0.30; (4) Road Design $0.30; (5) Bridge Design $0.30; (6) Construction $0.30; (7) Contracts, Estimates and Specifications $0.30; (8) Materials and Tests $0.60; (9) Soils and Foundations $0.60; (10) Maintenance and Equipment $0.30; (11) Traffic Engineering $0.60; (12) Right-of-way $0.30; (13) Cost Accounting $0.30; (14) Summary, References and Index $0.30; complete set of 14 chapters $4.50. Address Board at 2101 Constitution Ave., Washington, D. C.

Raymond Concrete Pile issues highway brochure

Raymond Concrete Pile Company, international foundation and heavy construction firm, New York, has published a brochure entitled "Founda-

(Continued on page 59)

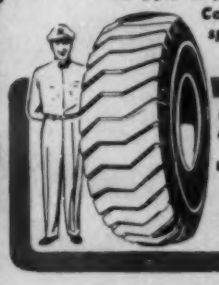
Get exactly the tread design your job requires At SOUTHERN TIRE!

AT YOUR SERVICE — the world's most complete range of tire sizes and tread designs in one shop — now at Southern Tire Company!

Whether you operate light or heavy equipment, Southern Tire can supply the tread design and size you need—and save you money at the same time. Superior equipment, including the greatest range of tire sizes and tread designs in the country, and the world's largest and finest three-sectional retreading mold, enables Southern Tire to retread any tire, regardless of growth, without buffing to the breaker strips. This, plus Southern Tire's long experience and use of finest tread rubber, assures you of guaranteed new tire service —and the tread design you need—at less than half new tire cost.

All special service tire sizes from 1100 x 24 to 33.5 x 33.

Call your favorite dealer and specify Southern Tire retreads



SOUTHERN TIRE COMPANY

1414 Broadway
SHEFFIELD, ALA.

Phone Collect
EV. 3-2312

. . . for more details circle 300, page 16

BUCYRUS ERIE

Your kind of machine...

the new 30-B

MODERN, PROVED DESIGN

The 30-B offers you proved, advanced design features that have made Bucyrus-Erie crane-excavators outstanding performers on all types of work.

Parts are simple, generous in size, few in number — with plenty of strength for dependable service without unnecessary weight to reduce working efficiency.

Air controls are easy to operate, conveniently placed, accurate. Hoist, crowd or drag, swing or propel, and steering clutches, as well as digging and swing brakes and dipper trip are air controlled.

Loads are distributed properly between upper and lower works by six conical hook rollers — two equalized pairs in front and two singles in rear. Precise machining, heat treating and flame hardening provide smooth rotation and long life.

Special greasing system, with remote control located at operator's position, for greasing swing pinion and rack; grease fittings grouped to save time.

TAILORED TO YOUR NEEDS

Choice of crawler mountings — five different sizes of crawlers and treads to fit requirements. Also, Transit Crane on rubber-tired carrier.

Power and drive options — crawler-mounted 30-B offered with gasoline, diesel (direct or torque converter drive) or single motor electric power.

Transit Crane — gasoline or diesel, 35-ton capacity.

Five front ends — both crawler machine and Transit Crane fully convertible to shovel, dragline, clamshell, crane, dragshovel.

Extra equipment for special jobs — includes various-length crane booms and jib extensions, independent propel, third drum unit, cathead, power controlled lowering on main hoist line.

Let your Bucyrus-Erie distributor give you all the facts on the all-new 30-B, show you why it is the *right* machine for your job. See him soon — or write for complete details. 318E57C

. . . for more details circle 212, page 14

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

Planning better roads

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

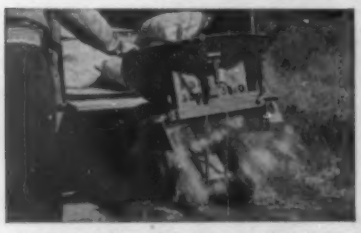
Stabilizing Shoulders with Rock Salt Costs Less . . . Gives Added Safety

Highway officials in many states have found that stabilizing road shoulders with rock salt is economical for two reasons. First, rock salt is relatively low in cost—and even with lower-grade materials, it helps provide better-wearing shoulders. Secondly, shoulders made with rock salt provide substantial savings in road maintenance. These shoulders have high density, so the aggregate is not readily blown or eroded away. And they actually protect the roadway itself by preventing water from seeping under the pavement edge.

From the safety standpoint, rock-salt-stabilized shoulders have the necessary load-bearing hardness to support emergency traffic in all weather. Soft-shoulder accidents are eliminated—and blinding dust is no longer a hazard. These modern shoulders also provide excellent drainage, so that water, snow and ice will not collect on the road surface.

To show how simple—and economical—it is to stabilize shoulders with rock salt, here is an actual step-by-step story of how this method was used on a U. S. Highway with a high traffic count. For safe, efficient stabilization of the shoulders, Sterling Rock Salt, produced by International Salt Company, was chosen.

1. The first step was to scarify and mechanically mix the shoulders to a depth of 4". Bank-run dirt with good clay content was added, as well as ¾" No. 2 stone, until proper mixture was attained.



2. Then, 6 lbs. of Sterling Rock Salt per square yard was spread on the shoulders. Application of this rock salt was by rotary spreader. After this process, materials were again dry-mixed.

3. Next, the shoulder was thoroughly wetted down. After wetting, soil was again mixed mechanically. Additional wettings were needed throughout this procedure, so that soil had optimum moisture content.

4. After mixing and wetting, all the materials were then bladed to a proper level for rolling. To provide for adequate drainage of water, a slope of at least one-half inch per foot was maintained on the shoulders.

5. Final step was rolling with rubber tires. Because rock-salt-stabilized materials compact more than unstabilized materials, the 6" depth of loose material was compacted to about 4" by rolling.

This stabilization procedure varies with particular soil and road conditions. For expert advice on how stabilization can work in *your* area, contact International.

FREE TECHNICAL ASSISTANCE ON ROAD STABILIZATION

International Salt Company will be glad to help you work out an effective, economical rock-salt road-stabilization program for your system. There's no cost or obligation. Just contact your nearest International sales office.

For further technical information on rock-salt stabilization, write for International's free series of booklets, "Better Highways." Address: International Salt Co., Inc., Scranton 2, Pa.

Sales offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

FOR ROADS, INDUSTRY, FARM, AND HOME—

STERLING SALT

PRODUCT OF INTERNATIONAL SALT CO., INC.

. . . for more details circle 341, page 16

(Continued from page 56)

tion Services for the Nation's Highways." It illustrates facilities for constructing foundations for highway structures, and shown are bridges and crossovers throughout the nation which are supported on Raymond pile foundations.

Since 1910, out of more than 36,000 contracts, the company has completed 881 contracts on highway bridges, approaches and allied structures, driving some 13,500,000 feet of piling. It has served 628 state and local highway clients and 103 private engineering concerns, representing 38 states, 59 cities and 38 state highway commissions. Among the illustrations is the world's longest overwater highway bridge, the Lake Pontchartrain Causeway, 23.8 miles long, which is supported on Raymond prestressed concrete piles.

New BPR Appointments

The following appointments have been made to fill certain of the principal new positions created in a reorganization of the Bureau of Public Roads.

Francis C. Turner—Deputy Commissioner and Chief Engineer
George M. Williams—Assistant Commissioner for Engineering
Joseph Barnett—Deputy Assist. Commissioner for Engineering
A. C. Clark—Assistant Commissioner for Operations
J. C. Allen—Assistant Commissioner for Administration
E. H. Holmes—Assistant Commissioner for Research

All of the above are career employees of many years' standing. Mr. Turner has been with the Bureau for nearly 30 years.

Jersey Turnpike Statistics Show Continued Gain

That lusty enterprise, the New Jersey Turnpike, had another busy and financially satisfactory year, according to the annual report of the Turnpike Authority to the Governor and members of the State Legislature.

Among the 1956 accomplishments noted:

1. Completion of the Newark Bay-Hudson County Extension and connection with the Pennsylvania Turnpike.
2. Establishment of an outstanding safety record, with a fatality rate dropping to 2.34 per 100,000,000 vehicle miles from 2.75 in the previous year.
3. Traffic for the year hung up

(Continued on page 63)

Prevent Expansion Joint Leakage

ALLIED JET SEAL

Even the most modernly engineered and constructed bridges are vulnerable to costly repairs and maintenance. If moisture is allowed to infiltrate through the expansion joints, bearings and other load bearing members will soon rust out as in the picture above.

Allied JET SEAL is the perfect solution to this problem. It is extremely rugged and long lasting . . . has superior qualities of adhesion, cohesion, resilience and ductility at low temperatures. Allied JET SEAL has no cold flow tendencies even at temperatures in excess of 300°F., giving assurance that it will not drop out of vertical construction joints.

Allied JET SEAL is truly the ultimate for sealing bridges, streets, highways and runways.

Jet Fuel, Heat and Blast Resistant Seal for Airports

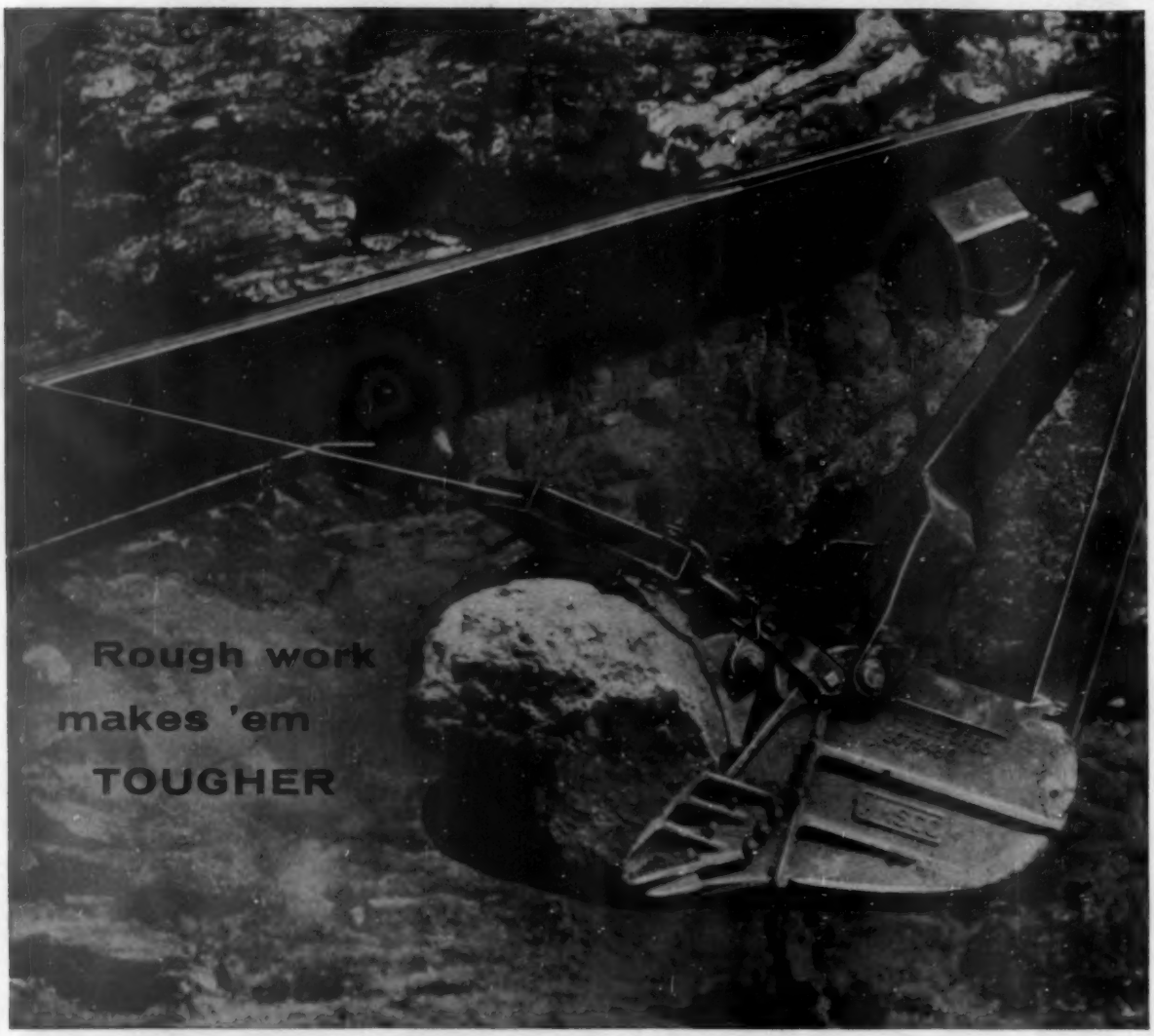
Allied JET SEAL will not be blown from the joints by the blast and heat of jet engines even after prolonged exposure. Nor is Allied JET SEAL affected by jet fuel, oil and solvents.

ALLIED MATERIALS CORP.

PRODUCERS, REFINERS AND COMPOUNDERS FOR OVER 25 YEARS

GENERAL OFFICES—Braniff Bldg., Oklahoma City, Okla., Phone RE 9-0592
PLANTS——Stroud, Okla.—Detroit, Mich.—Los Angeles, Cal.—New Market, N. J.
Brantford, Ontario (Canada)

. . . for more details circle 198, page 16



Amsco Backhoe Buckets **WORK-HARDEN IN SERVICE**

One-piece castings of extra-tough manganese steel give maximum impact and abrasion resistance

Impact work-hardens manganese steel to as high as 550 BHN. Further abrasion only polishes this tough steel. That's why Amsco® manganese steel outlasts other steels by as much as ten to one, under heavy impact and abrasion.

An Amsco Backhoe Bucket is a tough, *one-piece* manganese steel casting. This one-piece body eliminates the danger which fabricated-bucket users face of the hoe bucket breaking up when digging in rock or rough operations. The teeth on Amsco hoe buckets are reversible and renewable, and side cutters can be bolted on to order.

On scores of tough digging jobs, you'll find these Amsco buckets cutting a full swath, unloading cleanly and providing maximum digging efficiency.

Available in both standard and special styles, in all regular sizes from ⅜-yard to 1¼-yard capacity. For full information, call your nearby Amsco representative or your shovel manufacturer's dealer.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS- JOLIETTE QUEBEC

. . . for more details circle 204, page 16

One heavy-duty Adams 440 handled all the fine-grading on Sunken Meadow Spur Parkway, Long Island, New York. Contractor Henry Henslick, Smithtown, N.Y., readied the dirt grade for John C. Peterson, Inc., paving contractor. "440's" smooth, constant-speed, direct-drive blade controls let Henslick work faster than he could have with most other graders.

Easy blade operation speeds up all your grading

With a heavy-duty Adams grader, your operator cuts *miles* of smooth, accurate grades... fast! He manipulates the blade in easy, steady motion with positive, vibration-free controls. He is relaxed... confident of his machine... can work at fastest practical production speeds.

Accurate control from cab

All blade-positions your operator normally uses are power-controlled from the cab. He has *exact* control, because Adams' blade mechanism is always firm on its sturdy, one-piece, wishbone frame, and operates at constant speed — regardless of the number of controls in use. Blade positioning is fast... goes from deep ditch-cut to high bank-cut in much less than a minute... to other positions even faster. Moldboard turns 360° — clockwise or counter-clockwise — for quick changes from forward work, to reverse ditching and grading. Blade can be reversed at usual speed while under load.

No stretching for control levers

All Adams grader controls are within easy reach for standing or sitting operation — right in front of the operator. Very little effort is needed to operate blade-control levers. Power box gears, shafts, and clutches — all move on anti-friction bearings. Engaging of controls is smooth and fast, because Adams' three-jaw clutches mate without shock or kick-back. Control shaft universal joints are high quality roller bearing type, enclosed and lubricated for life.

Plenty of clearance makes blading easier

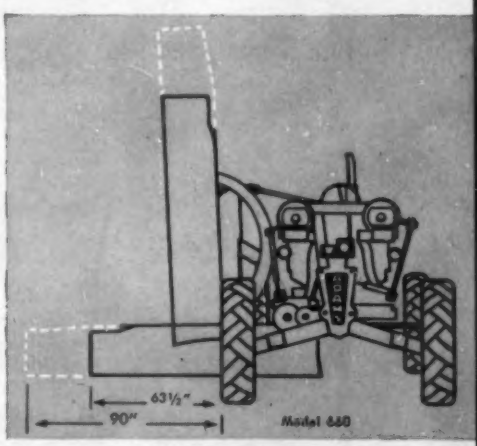
Adams graders provide lots of room for moving the blade, without hitting tires, frame, etc. You get jobs completed fast, because your operator gives more attention to grading, less to limitations of machine. He can turn blade, or make a deep cut at sharp angle without special care to avoid cutting tires. He positions blade for extreme shoulder reach ditch cuts or high bank slopes, without hindrance from mounted scarifier. The moldboard raises high, easily clears ground for climbing out of ditches and passing over grade crossings. Operator saves time and temper . . . you save possible cost of damaged tires, moldboard, or drawbar and circle assembly.

With its high-arch front axle, heavy-duty Adams graders straddle high-and-wide windrows of dirt, oil-mix, and gravel without interference to steering... and without bulldozing material, and wasting power.

With surface cut down to near final-grade, Henry Henslick's "440" backs-up to start a finish-cut. Adams 440 saves turn-around time by backing at speeds to 13.2 mph in 4th reverse gear... can back 1000' in 53 seconds.

See for yourself

Ask for an Adams grader demonstration. See how ease of blade operation combines with Adams' greater range of working speeds, to outproduce any other comparable grader. 6 sizes — 60 to 190 hp. Choice of G.M. or Cummins engines on 5 larger models.



Without stepping down from the Adams cab, you can move blade to normal operating positions shown in solid outline. Positive controls shift blade from horizontal to bank slope positions — or back — in less than a minute. Extra-wide or extra-high reaches shown by broken lines are also obtained by the operator from cab, after adjusting blade lift-linkage and blade-position on the circle.

Adams—Trademark AG-1263-H-b-4

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

. . . for more details circle 262, page 16

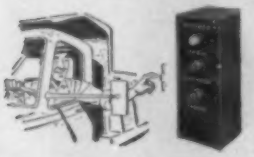
WHERE QUALITY IS A HABIT

It captured all eyes and "ayes" at the road show.....

COARSE STONE | FINE STONE | CEMENT | SAND

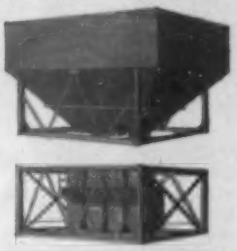
New One-Man Operated BUTLER TX-4 BATCHING SYSTEM that Keeps Pace with FOUR 34-E Pavers!

PUSH BUTTON CONTROLLED



Pre-set batchers can be operated by single batcher man at cement platform, or by truck driver at each bin.

MAXIMUM PORTABILITY



Bins are completely pre-assembled for easy crane handling, with hinged columns. Batcher units handled with all piping and wiring in place.

A new Concept in ULTRA HIGH SPEED BATCHING

If you were at the Show you saw it. Everyone did! New Butler engineered AUTOMATION so advanced, so flexible, so fast, so dependable that it *obsoletes* all existing roadbuilders' plants. It's the new BUTLER TX-4 Batching System, the modern batching plant that every contractor today *needs* to compete successfully. The contractor with only one paver starts with a TX-4 plant equipped with 2 batchers; then, as he expands with the road program, he simply adds additional batchers to the *same bins* to take care of 2, 3, or 4 pavers — and still retaining ONE-MAN OPERATION.

BUTLER BIN CO. 959 Blackstone Ave., Waukesha, Wisconsin

PIONEERS IN **AUTOMATION** FOR ROAD BUILDERS, READY MIX, CONCRETE PRODUCTS

Write for FREE copy of this bulletin giving complete details on every phase and feature of the new BUTLER TX-4 Batching System.

BASIC UNIT — Handles 1 or 2-batch trucks.

Coarse Stone | Fine Stone | Cement | Sand

EXPANDED UNIT — Batchers added to handle 4-batch trucks, 4 pavers operating at maximum capacity.

Coarse Stone | Fine Stone | Cement | Sand

. . . for more details circle 215, page 16

(Continued from page 59)

a new record, totalling 31,588,000 revenue vehicles—up to 22% from the previous year.

4. Toll collections were $24,513,000, an increase of 16%.

Daily traffic averaged 86,307 vehicles during the year, the high peak being the month of August when 3,235,870 revenue vehicles traveled the turnpike paying tolls of more than $2,500,000.

5. Aid rendered to motorists on the turnpike by state policy covered 48,029 cases, representing a 7% increase. Of these, 18,503 aids were for towing services, 10,915 for cars running out of gas, 11,912 for tire repairs.

The campaign against speeding and other violations resulted in speeding arrests numbering 17,369 for the year.

N. Y. Thruway Has "Healthy Financial Future"

A good bill of health financially for the future was given to the New York State Thruway recently in the Seventh Annual Report of the Thruway Authority. Gross revenue for 1956 totalled a record-breaking $26,448,000. The report was dedicated to B. D. Tallamy, the Authority's Chairman since 1950, who was recently confirmed as Federal Highway Administrator in Washington.

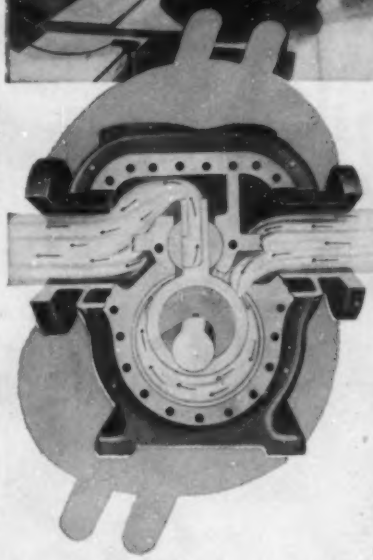
Individual trips on the Thruway more than doubled in 1956, compared with the previous year, rising to 32,126,000. Travel on the 562-mile Thruway system totalled 1.42 billion miles in the year.

Despite this heavy increase in traffic, the road's fatality rate was reduced to 2.68 deaths for each 100,000,000 miles of travel compared to 2.83 for the previous year. This compares with 5.4 for all New York State Highways and 6.4 national average for 1955.

The personal injury rate in traffic accidents on the Thruway for 1956 was 30.73 per 100,000,000 vehicle-miles compared with 323.9 for all New York State streets and highways (the latter figure for 1955—first data available).

Property damage from traffic mishaps likewise was spectacularly below the state-wide rate, the Thurway's rate being 127.3 as against 578.0 for the entire state.

Construction of the Thruway's Niagara, Berkshire, Erie and New England sections and the connection with the Garden State Parkway in New Jersey, was pushed in 1956 with the awarding of $115,500,000 in contracts.



The stakes are too high to risk big losses in down-time on a "price" pump when it comes to moving asphalt. Experienced asphalt men ...men who move thousands of tons a week...know that KINNEY Rotary Piston Pumps do the job, *keep doing the job* and with low, LOW maintenance cost! And, do you know that, in addition to savings in down-time, there's also big fuel economy with the famous

Kinney®

ROTARY PISTON PUMP

The KINNEY Pump consistently outperforms other pumps — handling tars and asphalt at least 30° cooler. Consider the time you save getting viscous asphalt up to pumping temperature. Think of the fuel you save over the course of the year. These savings are important, but the big, vital point is the savings in down-time and the peace of mind you enjoy with a KINNEY Asphalt Pump on the job!

KINNEY Rotary Piston Pumps are original equipment as a metering pump on leading asphalt mixing machines. Plain and steam jacketed KINNEY Pumps are available in the standard SD Model with capacities to 500 GPM.

WRITE... for Bulletin L-51-A fully describing KINNEY Rotary Piston and the famous Heliquad Gear Pumps.

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3537G WASHINGTON STREET • BOSTON 30 • MASS.

Please send me Bulletin L-51-A containing full information on KINNEY Rotary Piston Pumps.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

. . . for more details circle 256, page 16

Gets back on new slab sooner — speeds paving schedules

KOEHRING 16-E *twinbatch*® paver on rubber tires is as mobile as your batch trucks. It works on or off-pavement — can get back on new slab in as little as 7 days to pave adjoining highway strips, scattered intersections, approaches to driveways and side roads. This time-saving "run-about" makes self-powered moves at 9 m.p.h. Yet, for all its mobility, the Koehring 16-E *twinbatch* is primarily a production paver — exceeds the output of large single-drum pavers on main highway work. For instance —

On straight-production paving, the Koehring 16-E hits a top output of 86.7 batches an hour (based on 60-second mixing cycle). This *reserve* production capacity with *twinbatch* Autocycle mixing offsets normal job delays — lets you pick up lost time which cannot be made up with a limited production single-drum paver.

Averages 50 cu. yds. an hour

As a result, the Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour — with a small crew — on your main-highway paving jobs.

While its usefulness is unlimited as a general-purpose paver, this versatile Koehring 16-E also serves as a mobile concrete mix plant. On construction of curbs, gutters, culverts, bridges, pilings, it discharges into overhead hoppers, forms, chutes, or loads trucks. Elevating boom reaches up and out 60° — gives controlled discharge at 21-foot height (higher with special boom).

See for yourself how the big production capacity, overall versatility, and rubber-tired mobility of this Koehring 16-E *twinbatch* can put you miles ahead on your paving schedules. Get all the facts from your Koehring distributor, or write us for 16-E catalog. Big 34-E *twinbatch* is also available for major highway, airport paving.

KOEHRING Company
Milwaukee 16, Wisconsin

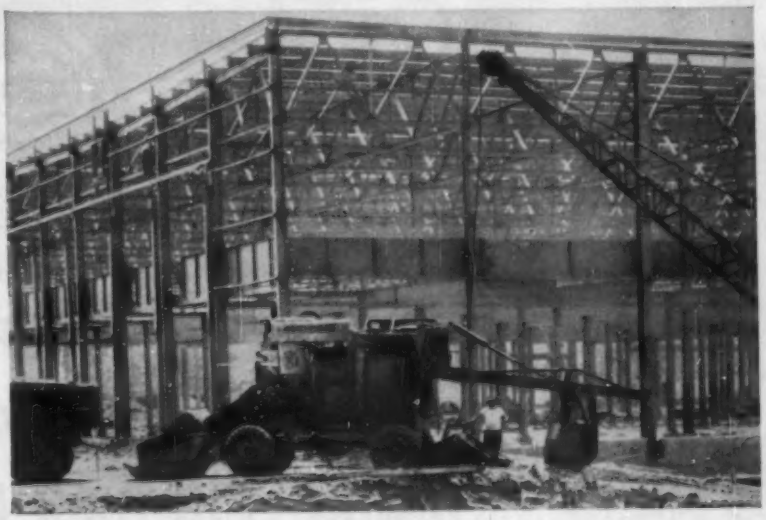
(Koehring Subsidiaries) JONTESON • PARSONS • KWIK-MIX

Big rubber-tires are easy on the sub-grade

Notice how there's little or no scuffing on the sub-grade with a Koehring rubber-tired 16-E paver. When working between forms, flotation of the big 11:00 x 20 pneumatic tires protects the grade against surface damage — saves unnecessary filling and re-leveling. This rubber-tired advantage also lets the Koehring 16-E *twinbatch* work on pavement without planking to pour adjoining slabs, widen highway and airport strips, pave intersections, pour concrete for curbs, gutters, culverts.

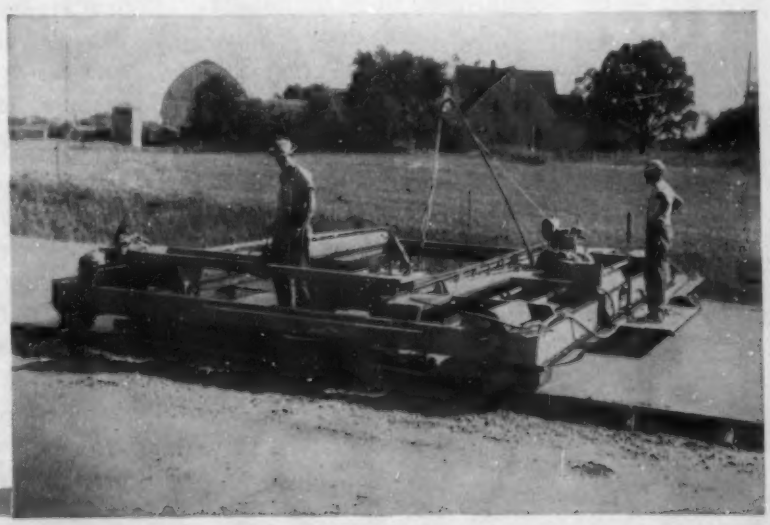
Mobile 16-E paver serves as a concrete mix plant

On building construction, versatile Koehring 16-E *twinbatch* pours footings, floors, columns — is never "grounded". Power-controlled boom swings in a 160° arc, or elevates 60° for overhead discharge — locks and holds in any position. Controlled-discharge bucket dumps anywhere along the 25-foot boom, can be opened or closed at any time for gradual discharge. Water-level capacity of bucket is 24 cu. ft. That's more than ample capacity to hold the full 16 cu. ft. batch of concrete, plus 10% overload.



Precision finisher keeps up with any paver

"Timely", precision-finishing is important on any paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete—harsh, wet or dry. It overcomes slump difficulties on grades and elevated curves. Produces mechanically accurate concrete slab surface, 8 to 30 feet wide, with uniform crown transitions.



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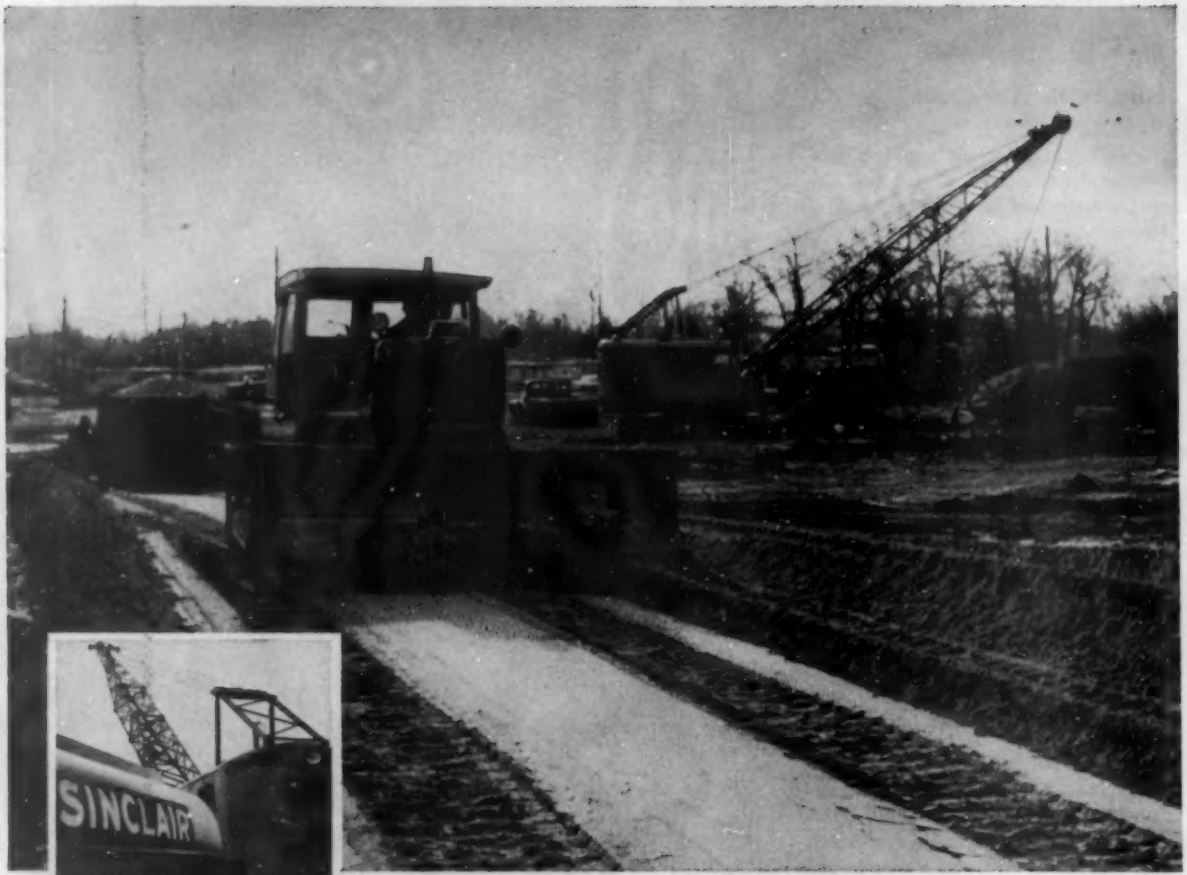


35% ahead of schedule on the Indiana Turnpike...

THANKS TO SINCLAIR OILS AND GREASES!

For an outstanding job on the Indiana Turnpike, J. C. O'Connor & Sons, Inc., contractors, share the credit with Sinclair.

Delwin Libby, Grade Superintendent, says: "We have moved just under 3,000,000 yards of sand in seven months. This project has been done using a minimum of types and grades of oils and greases. The result has been a reduction in lubrication inventory, savings in labor, lessening the danger of misapplication, and *no failures due to lubrication*. Sinclair's cooperation has been of great value in helping us make this record."

You too can rely on Sinclair for dependable products and service. Just call your nearest Sinclair representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation!*

SINCLAIR LUBRICANTS
for every construction need

. . . for more details circle 332, page 16

21 Twin-Engine Units

Speeded 4,000,000-Yard Grading Job

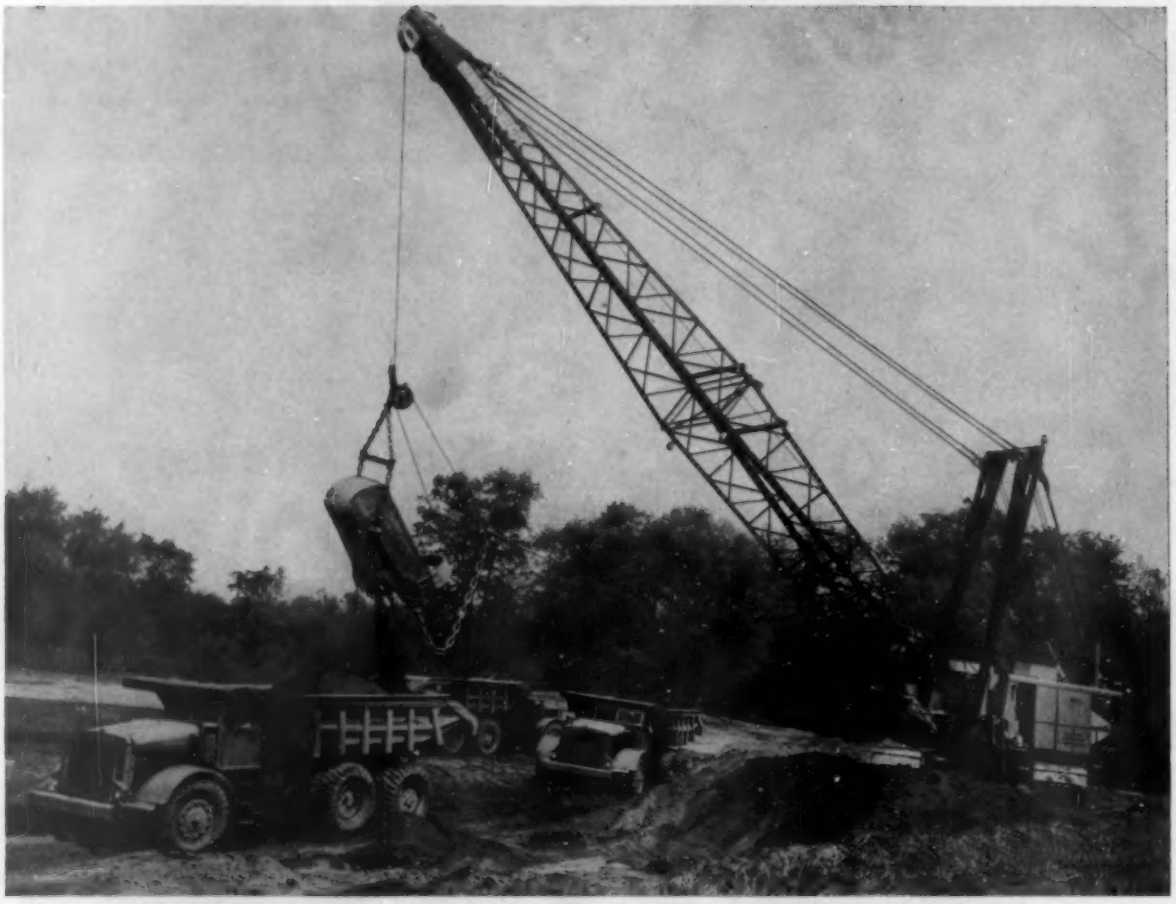
Notes on how Western Contracting Corporation cleaned up all but the crumbs in 150-day period on their Indiana Toll Road project, using a 5½-yard dragline, six 50-ton end-dump trucks, 10 twin-engine and 4 single-engine scrapers, 5 twin-engine push tractors, six 6,000-gallon water wagons and over 300 other pieces of equipment.

By Hubert C. Persons
Contributing Editor to Roads & Streets

THE largest assembly of heavy grading equipment on any section of the Indiana Toll Road—365 pieces, taking items down to small pumps—was used by Western Contracting Corporation in moving nearly 4,000,000 cu. yd. of material. Practically all of this yardage was moved between June and November of 1955. The 13.9-mile section near Bristol, Ind., included a mile-long fill, maximum height 34 ft., carrying the road across low ground and over the New York Central Railroad and a county road. Specific items included 3,000,000 cu. yd. of borrow material, 55,000 cu. yd. of peat excavation, 106,000 yd. of special fill, 406,000 yd. of common, and 176,000 yd. of ditch and waterway excavation. Also top soil stripping totaled 92,000 cu. yd.

To insure production with minimum mechanical interruptions, the contractor set up complete central repair facilities under cover on a 35' x 35' concrete floor. This shop was staffed by factory-trained mechanics and was equipped to perform the heaviest repair operations. Each of four spreads also was supported by individual maintenance shops housed in trailers for minor repairs and routine maintenance. Much of the equipment was new, purchased especially for this project. Some of the units incorporated features not previously built into earth-moving machinery and hence their performance was closely observed by factory engineers.

● **Bottom-dumps also figured in Western Contracting Corporation's job. Note special telescoping floodlight tower.**



● **Eight-yard bucket dropping to 50-ton wagons, part of Western Contracting's scheme of handling earthmoving on 14-mile, $7,000,000 toll road project.**

In commencing construction, the contractor began stripping and related work in June by setting up a spread for this purpose. This included four Caterpillar D8s with 15-yd. scrapers, two Caterpillar 12 motor graders, two Allis-Chalmers HD-20 pushers, one 50-ton pneumatic roller and a 6,000-gal. sprinkler (converted Euclid).

The first move was to strip and stockpile the heavy topsoil for future use on slopes and dividing strip. Unsuitable material was wasted. Undercutting one foot below ground line was also required on some sections where the finished grade approximately followed the original ground line. The purpose was to insure drainage, aid in preventing differential settlement, and to aid in detecting any unsuitable material such as peat, organic matter, and heavy concentrations of roots in wooded areas which might have been missed in the original soil survey.

Both top soil stripping and undercutting were paid for on an estimated average depth basis. All undercut material suitable was specified to be put on sections where fill of 5 ft. or more was required.

● *The main earthmoving work* was first tackled with a second spread which included a Manitowoc Model 4500 equipped as an 8-yd. dragline, loading Euclid 50-ton twin-engine end-dump trucks. Six of these Cummins-powered hauling units were used in this borrow pit operation involving up to 4,000 ft. one-way haul. On the grade were two Cat 12 motor graders, two D8 dozers, one 50-ton pneumatic roller and a 6,000 gal. Euclid-drawn tanker.

As the work progressed a third and then a fourth spread were put in operation, and production built up to 40,000 cu. yd. per day or more. Each included four TS-18 Euclid twin-engine, 18-yd. scrapers and two Euclid TC-12 twin-engine pushers. The scrapers were each powered with a GM Detroit Diesel 300-hp engine in front and a 200-hp engine in the rear.

Each spread included one additional twin-engine scraper kept in reverse as a standby unit. These scrapers were equipped with Goodyear 33.5 x 33 (38 ply) tires.

Other equipment in the third and fourth spreads included the usual complement of graders, bulldozers, pneumatic rollers and water trucks.

As the aforementioned mile-long fill progressed, two 10-hour shifts were started. On typical shifts four Euclid Scrapers moved from 600 to 700 loads. The day shift started at 6 a.m. The night shift began work at 5 p.m. and ran until 3 a.m. When necessary, because of wind and low humidity, blades, rollers and water trucks were worked through until the morning shift in order to keep fills in proper shape. Light for night operations was provided by truck-mounted Sperry generators with 40-ft. hydraulically raised towers.

For construction, fill material was hauled from 23 different borrow areas some of which also contributed material for subbase and special fill.

Specifications required clean granular soil falling within A-1, A-2 and A-3 HRB classification.

Material was bladed out and compacted in 6 in. lifts, with 50-ton rollers. Compaction was to 95 percent standard AASHO density, going to 100 percent for the upper 12 in. of fill, as determined by tests with a Raynhart densometer. Compaction tests were made in the ratio of one for every 1,000 cu. yd. Testing for density was done by one man on each shift working from a four-wheel-drive Jeep.

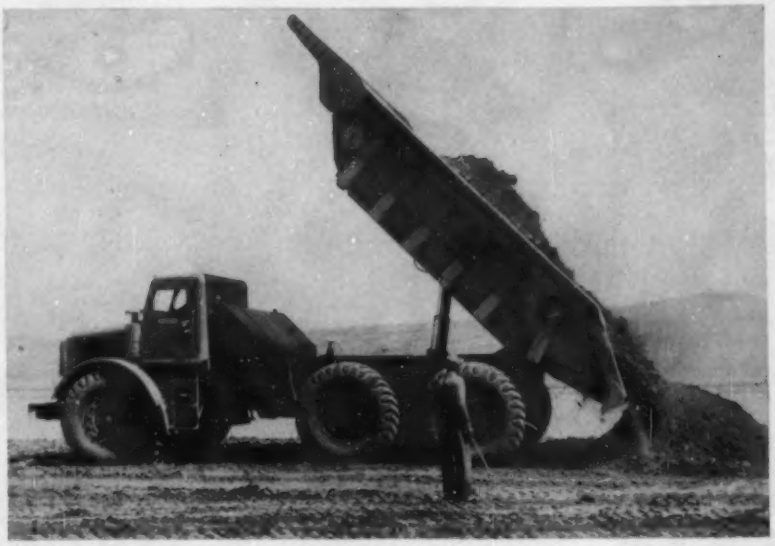
The season being unusually dry, more than 30,000,000 gal. of water was required for compaction moisture and haul road sprinkling. On windy days of low humidity, as much as 800,000 gal. per day was required. All six of the 6,000 gal. sprinklers were kept busy. Supply was from gravity tanks which were filled by Worthington pumps and fitted with 10-in. pipes for rapid loading.

The fact that all of the borrow soil used was granular created an erosion problem. On superelevated roadway sections and fills above 10-ft., it was necessary to install 13,750 lin. ft. of steel curbing to prevent the shoulder soil from washing. This curbing was constructed of 4′ x 4″ steel strips, driven into the outer shoulder.

● Drainage for the entire 13.9 mile section utilized 7,490 lin. ft. of reinforced concrete pipe in diameters from 18 to 72 in. and 1,349 lin. ft. of coated corrugated metal pipe. Rundowns took another 1,397 lin. ft. of corrugated pipe. Drainage pipe was placed with a Bucyrus-Erie 22-B backhoe. Four Barco gasoline rammers were used in compacting backfill. Where pipe was of large diameter the excavation was made sufficiently wide to permit the use of a pneumatic roller.

In addition to equipment previously mentioned, the contractor used a Bucyrus-Erie 54-B dragline with a 2½-yd. bucket for removal of 55,000 yd. of peat. No attempt will be made to fully enumerate the many pieces of supporting equipment which included, to give one example, nine new half-ton Chevrolet pickups for personnel.

R. K. Ames and M. G. Schaller were project managers for Western Contracting Corporation, with L. G. Langston as project engineer. Associated Professional Engineers were the contracting engineers, with D. Randolph Parsons as field construction supervisor and Malcom Schaller later serving as project engineer. J. E. Greiner, general consultant for the Indiana Toll Road Commission, was represented by A. F. Divall, liaison engineer, and G. O. Kerkhoff, chief soils engineer.



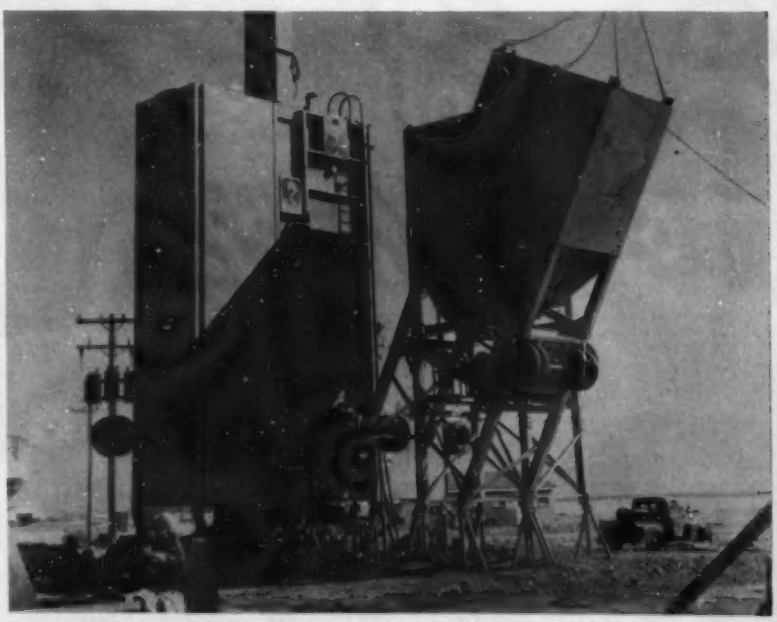
● **One of the twin-engined dump trucks—familiar on dam work but an innovation on highway construction.**

Tilt-down batcher designed by contractor

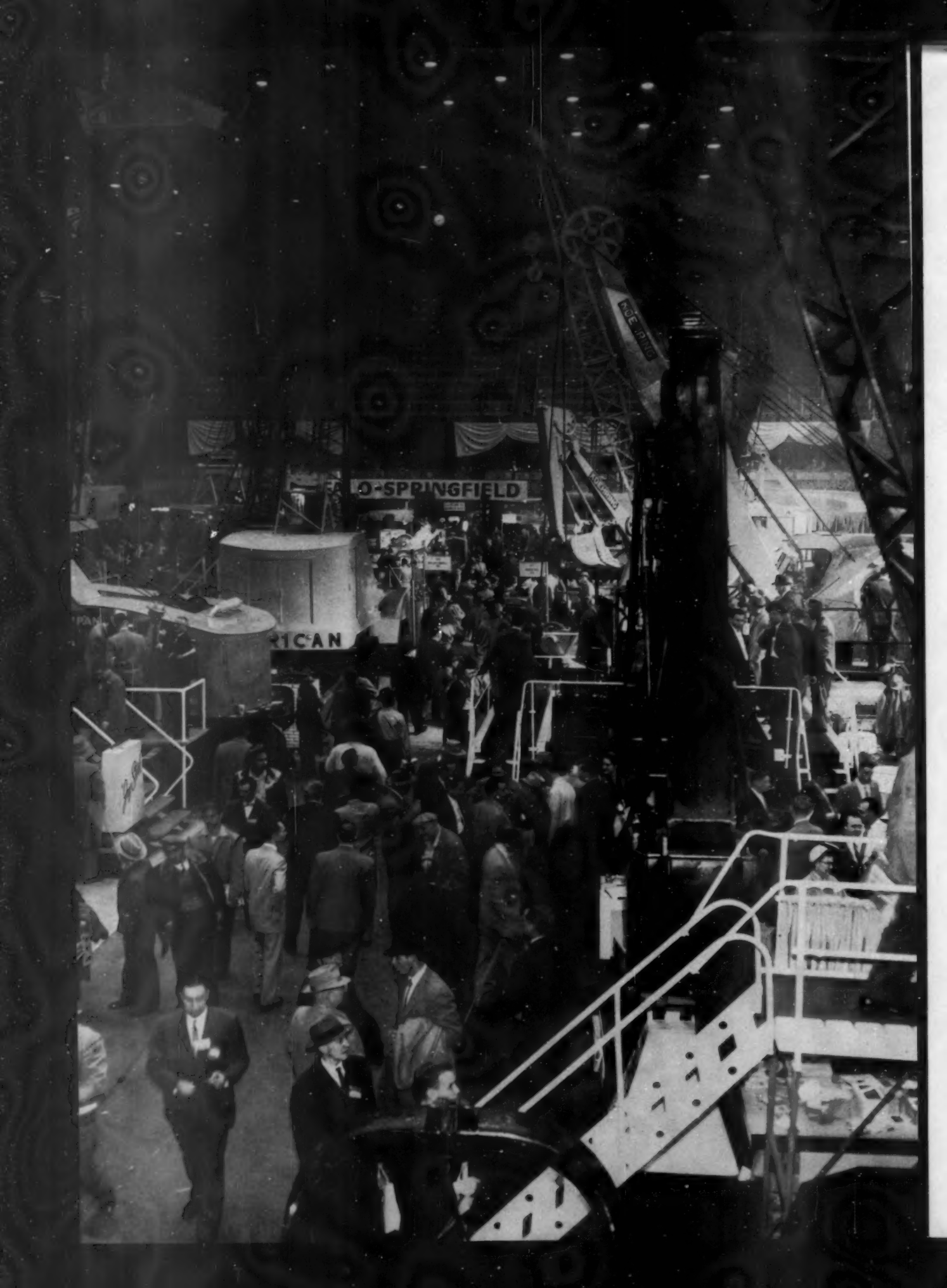
Pictured here is something new in mobile batch plant equipment—a bin that not only can be dismantled but can be turned on its side and sent rolling over the highways, in a matter of hours.

The first section of the plant consists of a total of 7 separate wheeled sections, as assembled and put to use at Gowen Air Force Base near Boise, Idaho. The contractor Morrison-Knudsen Co., Inc., designed the unit with the help of Idaho Sprocket and Machine Works, Inc., for use on the Gowen project. The contractor used the tilt-down plant to supply dry-batched concrete materials for paving aircraft and vehicular parking areas.

The sections of the plant include three 500-bbl. cement silos, a cement elevator, two double-bin aggregate hoppers and a supporting base. Each section after being lowered by the crane, becomes a trailer unit for towing by truck over the road to the job.



● **Tilt-down batcher developed to specifications of Morrison-Knudsen, Inc. being taken down for transport.**


O-SPRINGFIELD

Chicago's "Big Week" in Review

Observations and highlights from a history-making seven days—in which 67,000 visitors saw the largest machinery exhibit ever held under roof—and took a fresh look at the $100 billion roadbuilding program together with the tools and techniques available to accomplish the job.

BY MONDAY noon on February 28, the convention planners in the offices of ARBA, CIMA, AED and IRF knew they had a smash hit on their hands. The crowds poured in, assaying high in contractor people—the guys who will buy most of the machinery of the types on exhibit.

"We'll make our predicted 30,000," one official was overheard to say rather jubilantly along about Tuesday. On Thursday afternoon the 60,000th visitor registered at the show, and the new names were still coming in when the Amphitheater closed Saturday noon and the 67,000th registrant was shooed out of the hall.

It is a point of comment on that even the most enthusiastic and confident of our industry's leaders were taken by surprise at the evidence of strength shown by this turn-out. Throughout the entire week this reporter heard not one single word of unhappiness from any exhibitor. And many had broad smiles over the deals for equipment pending or closed during the week.

• The success of the week can be credited to many factors. We are in a boom period. The outlook, despite a slowing of housing and some building construction categories, is good, and with respect to highways, "terrific." The Show was held in winter, when the men could best get away from their jobs. It was the first Show in nearly a decade.

More importantly, the Show brought into focus a decade of mechanical and product advancement which only such a spectacle could reveal in its full breadth and significance. This advance has taken place, machine by machine, year by year since the War until today's tractors, shovels, scrapers, loaders, pavers, compactors, compressors, drilling equipment, etc., etc., and the engines, transmissions, axle drives, tires and accessories that go along with them are far in advance of wartime models. With Congress' blessing in the form of a multi-billion, 13-year financing program, the Show could not have been better timed.

• Finally, of course, some one had to plan the Show and all the related events. The week was a monument to beloved Harold Hess of the Construction Industry Manufacturers Association, whose untimely death occurred in the midst of the preparation. To his successor Bob McKenrick, new Executive Vice President of CIMA, and to CIMA's show manager, Bill Hogan and staff and vice president Carl G. Allen, must go great credit for their part in the intricate, prolonged and sometimes painful task of allocating space and seeing that everything got done on time. And Kenneth Lindsay, CIMA's president during the past two years, contributed the kind of top leadership and direction such a gigantic effort requires.

The Show's success was aided by the full utilization of modern trade fair techniques, such as provision of ample corridor width, skillful arrangement of display areas, good lighting, and imaginative development of the displays by the exhibitors themselves. Visitors will recall the nice

Julien R. Steelman, President of ARBA for 1957

Clarence E. Killebrew, new president of CIMA

E. V. Williams, to head ARBA contractors

touch of naming the corridors after such famous roads as the Ohio Turnpike and U.S. 1. Booth telephones were used at the rate of 3,000 calls per day, greatly aiding the show's effectiveness.

The advance publicity was handled in an unprecedented build-up under the guidance of a special publicity committee headed by H. S. Scribner of the Russell T. Gray agency. Tens of thousands of dollars' worth of free ad space was donated by the construction and engineering magazines and a publicity task force under ARBA's public relations director Bob Smith kept the nation's press, radio and TV fed with show material.

Many related activities helped swell the attendance and make the week a fruitful one to visitors:

(1) The American Road Builders' Association's general and technical committee sessions at the Congress Hotel, its Contractor's Division luncheon and the Annual Banquet preceded by the Firestone cocktail party, made up a separate orbit of activity during the week.

(2) Concurrently the Associated Equipment Distributors held their annual convention, with a record 4,000 in attendance, staging a separate supplementary equipment exhibit for firms not participating in the Road Show proper.

(3) The International Road Federation's International Headquarters at the Drake Hotel, plus its three-language Road Seminar, drew over 1,500 foreign visitors, not counting 2,000 who came from other countries as equipment distributor delegates and trainees. The IRF World Highway banquet was attended by 750 people from 60 countries.

(4) The National Bituminous Concrete Association staged its second annual meeting during the week, drawing a full house at its all-day technical conference.

(5) Individual manufacturers in the midst of the melee found time to play host to many visitors. Typifying the growing export activity, Caterpillar held a press conference at which engineers from nations around the world spoke on highway development in their countries.

There were 277 exhibitors, representing virtually the entire rank of CIMA members, including some new members who scrambled to get into the act.

Equipment valued at over $12 million was shown in space totaling 350,000 sq. ft., making it the largest machinery exhibit ever held under roof. It took 400 workers to unload the 112 rail cars and 705 truck-loads of the stuff displayed.

THE MANUFACTURER'S ROLE

During the "Big Week" the Construction Industry Manufacturers Association held its annual meeting, at which time Kenneth Lindsay turned the president's gavel over to Clarence Killebrew. Lindsay in reviewing CIMA's past year counseled the membership, who make up 95% of the industry's equipment manufacturing capacity, to get behind the highway effort in their home communities. He said that the help of everyone is needed to aid chambers of commerce and other groups in working out solutions to local road problems.

The Road Show should possibly be repeated in four years, rather than wait another decade, said Lindsay, as a stimulus to the national highway effort.

General Louis W. Prentiss, executive vice president of ARBA, told the CIMA gathering that the ARBA's task force committee reports on the industry's manufacturing and contracting capacity were a major factor in securing passage of the 1956 highway act by Congress. He observed that ARBA was able to speak with unique authority because of its diverse membership representing a balanced cross-section of the various industry elements.

The General outlined ARBA's expanding headquarters activities, which currently include the launching of a news letter, enlargement of its monthly magazine, planning of a motion picture for showing to high school and college students as an industry recruitment effort, the continued growth of the Materials and Services Division (which had 40 Road Show exhibitors), and the organization of a new Credit and Financing Division.

This latter division is planning an industry sur-

(Continued on page 77)

Modern Heavy-Duty Diesels

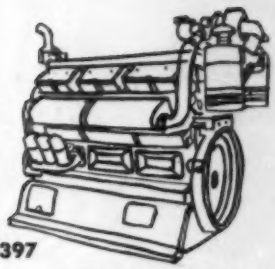
From a quarter century of diesel leadership, now comes the world's most advanced line of diesel engines

Designed and developed by Caterpillar research, these compact units pack more power in less space and deliver greater efficiency, greater economy and longer life in any application. And they're all ruggedly built for *hard work*.

To meet your requirements, Caterpillar's modern power line is available in industrial engines, torque converter power units, spark-ignition engines, welders and electric sets up to 650 HP (maximum output capacity) and 350 KW. Also available is a complete line of marine engines up to 500 HP (continuous duty).

You have your choice of hundreds of variations. All units incorporate the latest advances in modern heavy-duty design. They're available as original or replacement power for excavators, cranes, ditchers, asphalt plants, crushers, compressors, welders, electric sets, pumps, drill rigs, sawmills and other equipment.

See the following pages for a summary of this rugged, modern power line. For complete information, see your Caterpillar Dealer!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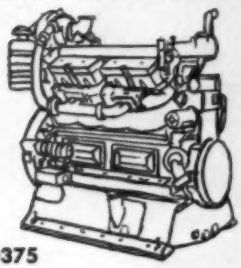
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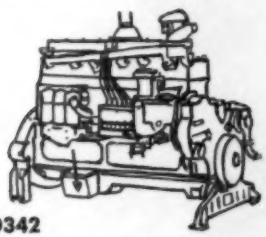
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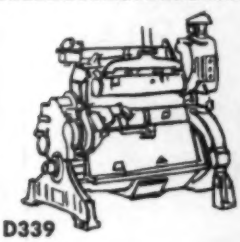
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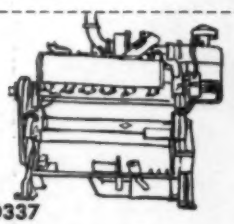
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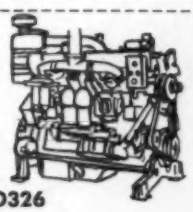
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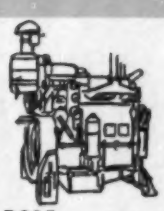
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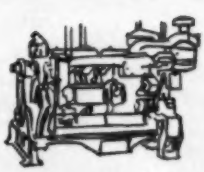
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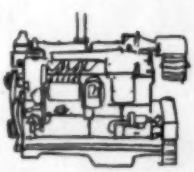
D315
(Series G)


D318
(Series G)

MODERN HEAVY-DUTY CATERPILLAR DIESELS

for Excavators, Cranes, Ditchers, Asphalt Plants, Crushers, Compressors, Welders, Electric Sets, Pumps, Drill Rigs, Sawmills and other equipment

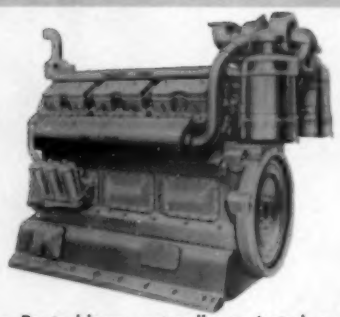
What modern heavy-duty diesels are

Compared with the heavy-duty diesels of the past, modern heavy-duty Caterpillar Diesels are compact and sturdy. They're the latest results of Caterpillar research to increase production and lower operating costs in your equipment. Manufactured by modern techniques from modern materials, they save space, fuel and maintenance time in any application. Bulk has been eliminated. Power and longer life have been added by superior design and metallurgy.

Why they do a better job than ever

Caterpillar's modern heavy-duty diesels feature the four-cycle design which provides a smooth, long, effective power stroke and a more efficient utilization of power. They require practically no attention. Their fuel system requires no adjustment. There are no cylinder ports to clean. And Caterpillar's single-orifice fuel injection valves combined with the precombustion chambers permit use of a wide range of fuels including premium diesel fuels as well as low-cost No. 2 furnace oil. All these and other features add up to new performance standards in diesel power!

For complete information about modern heavy-duty diesels, see your Caterpillar Dealer

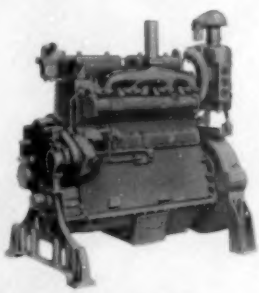


D397

with Turbocharger

650 HP*

Also available as a Roots blown, naturally aspirated or spark-ignition engine, and as electric set or torque converter power unit. Choice of air, electric or gasoline starting system.

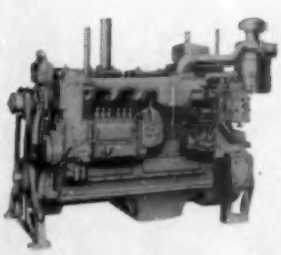


D339

Naturally Aspirated

140 HP*

Choice of air, electric or gasoline starting system.



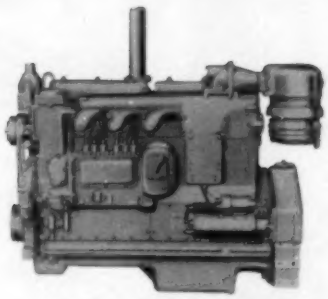
D318

Naturally Aspirated

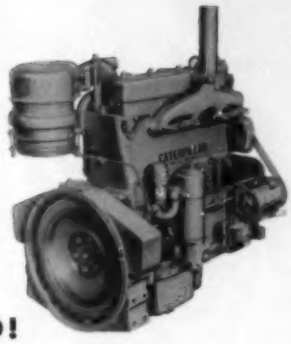
137 HP*

Also available as an electric set or torque converter power unit. Choice of air, electric or gasoline starting system.

NEW D318
(Series G)
Turbocharged
175 HP*



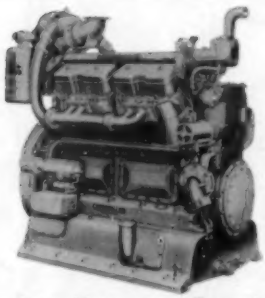
NEW D315
(Series G)
Turbocharged
115 HP*



SMALLER, LIGHTER AND LOWER PRICED!

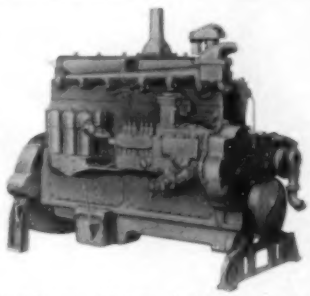
Keeping in line with Caterpillar's continued diesel leadership are these new Series G engines. They are designed for use in installations where space is at a premium. Both are small, light and low-priced; yet they deliver dependable power with the renowned Caterpillar durability. Also available naturally aspirated (shown above). Choice of air or electric starting system.

D375
with Turbocharger
430 HP*



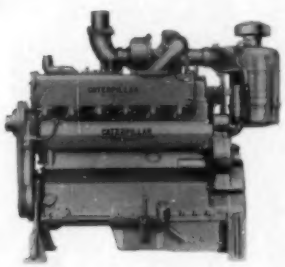
Also available as a Roots blown, naturally aspirated or spark-ignition engine, and as electric set or torque converter power unit. Choice of air, electric or gasoline starting system.

D342
Naturally Aspirated
210 HP*



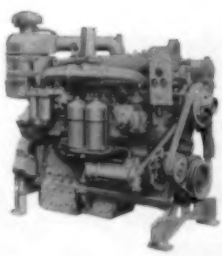
Also available as an electric set. Choice of air, electric or gasoline starting system.

D337
with Turbocharger
310 HP*



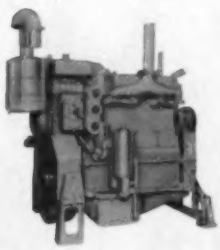
Also available as an electric set or torque converter power unit. Choice of air, electric or gasoline starting system.

D326
Naturally Aspirated
200 HP*



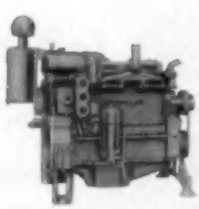
Also available as an electric set or torque converter power unit. Choice of air, electric or gasoline starting system.

D315
Naturally Aspirated
91 HP*



Also available as an electric set or torque converter power unit. Choice of air, electric or gasoline starting system.

D311
Naturally Aspirated
65 HP*



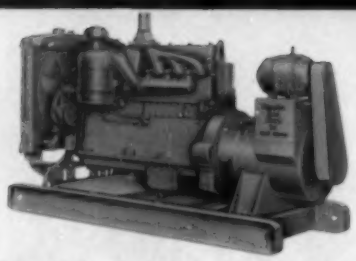
Also available as an electric set. Choice of air, electric or gasoline starting system.

*Maximum output capacity

Modern heavy-duty CAT* Diesels

ELECTRIC SETS

Dependable electric power, featuring the new Cat Generator, available in standard voltages, 60-cycle in the following KW sizes: 30, 40, 60, 100, 150, 165, 200, 225, 250, 315, 350. Also available as 50-cycle and D.C. units.



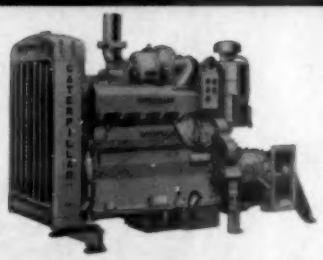
The new Caterpillar Generator brings you the best features of self-regulated and externally-regulated generators in one compact package. It means more for your money. While Caterpillar is prepared to supply you with almost any kind of generator you specify, your best buy is the Cat self-regulated Generator.

Advantages of the new Cat Generator

1. Designed to match exactly the Cat Engine powering it. 2. Regulator with no moving parts provides steady, self-regulated voltage, no load to full load. 3. No adjustments necessary after installation. 4. Easily installed, no complicated switchgear or external voltage regulators are needed. 5. Easily synchronized with other generators now in use. 6. Big electrically, handles surge of heavy loads; rugged and easy to maintain; small and compact.

TORQUE CONVERTER POWER UNITS

Many different arrangements are available for each of six Cat Engines to provide you with a greater selection of power packages.



Wide choice of power units: Engine and torque converter; engine, clutch and torque converter; engine, clutch, torque converter and reverse gear.

Wide choice of output shafts: Standard heavy-duty drive for side loads; narrow chain housing for side loads; wide chain housing for side loads; output shaft for in-line loads only.

Advantages of Cat Torque Converter Power Units

1. Torque output is automatically matched to load. 2. Loads start smoothly. 3. Load movement can be controlled without using clutch. 4. Overloads cannot stall engine. 5. Need no special hydraulic oil — their fluid is engine fuel — fluid level automatically maintained. 6. Cat Diesel Engine burns a wide variety of fuel oils cleanly and efficiently, even when idling.

Specify modern power—Caterpillar power!

On this page—and the three preceding pages—you've seen a summary of Caterpillar's modern heavy-duty engines. Either as original or replacement power, there's one among the hundreds of different arrangements that exactly meets your needs. Leading manufacturers of machinery can supply these models in the equipment they build. For complete details about them, see your Caterpillar Dealer. He backs you with prompt service. He has the experience and technical knowledge to help you with your power problems!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

HUNDREDS OF DIFFERENT UNITS TO MEET YOUR POWER NEEDS

WANTED— THE HARD WORK

PRINTED IN U. S.

EQUIPMENT TRENDS AT THE ROAD SHOW

– and what they mean to contractors and engineers

More horsepower, more traction, more mobility, better controls, greater range in sizes of related machines, innumerable mechanical refinements, among the innovations unveiled at the Road Show in Chicago.

AS THIS is written in the days immediately following the Road Show, no doubt thousands of individual contractors—and not a few engineers and specification writers—are pondering the confusion of new equipment developments seen at the Show.

With the Federal Interstate Highway Program starting to roll, equipment manufacturers have girded themselves for terrific competition. Their problem will be to demonstrate to equipment buyers that it is profitable to purchase the new machines, despite price advances which are sometimes in the "sharply up" classification and which are badly worrying many contractors today.

THE "BIG WEEK" IN REVIEW

(Continued from page 72)

vey to secure data needed to better solve the problems of equipment financing.

CIMA delegates also heard briefly from Robert O. Swain, executive director of International Road Federation, Washington, D.C. IRF was organized by groups representing U.S. construction equipment, petroleum, rubber interests and others to foster the development of good roads association abroad. Today such groups in 57 countries are contributing to the accelerating boom in highway construction around the globe. World highway expenditures totaled a record of $12.9 billion last year, the nations outside the U.S. expanding their programs 35% in a single year. One-fifth of all U.S. construction machinery is now sold abroad.

The cooperation by our nation is a growing one, noted Swain. IRF's program has included industry-supported fellowships for advanced study in highway engineering which to date have sent 98 engineers back to their home countries to take leadership roles in their countries' public works programs. Presently 37 students from 17 countries are studying in U.S. colleges.

The basic tool of the road builder, the crawler tractor, has been greatly improved in the postwar years, giving it a wider than ever range of usefulness. One of the major developments has been the introduction of the over-300-hp tractor with a basic weight in excess of 25 tons. One twin-engine tractor has over 500 hp.

This compares to 1948's largest crawler-tractor of 130 drawbar hp in contrast to today's comparable model of 155-160 drawbar hp for one manufacturer. Although this drawbar increase is only 10% to 15%, engine hp has increased considerably more, in many instances, without increasing the displacement or weight of the engine. This increased power is used for boosting brakes, steering controls and other operating and safety features.

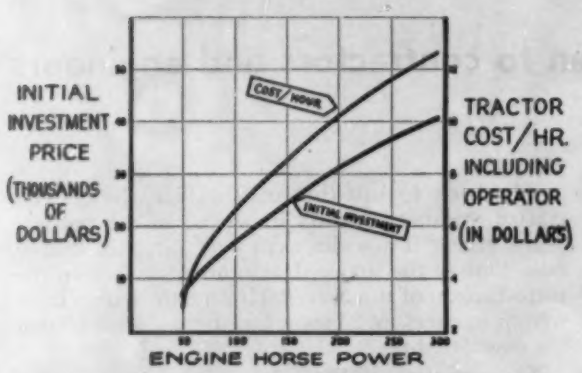
"On the job" availability of equipment has been greatly increased, notes a Caterpillar spokesman. Advances in metallurgy have reduced track wear, despite more speed, weight and horsepower. Clutches and steering have been redesigned to combat friction, notes one manufacturer who speaks for the field.

Many options are offered to provide more specialized application of crawlers to special jobs. These options include choice of speed ranges, starting methods and sizes and types of tracks. Larger machines can be purchased with either direct-to-drive or torque converter drive, depending on application and preference.

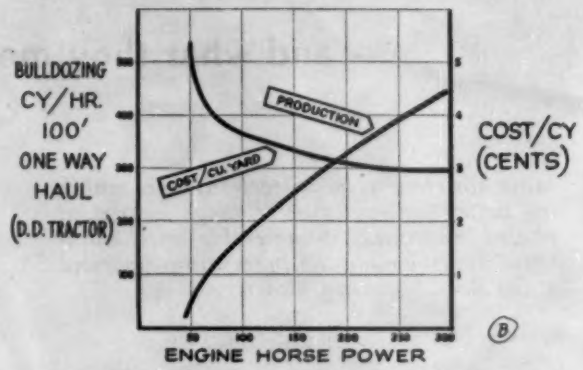
Tractor-scraper combinations represent one of the most spectacular changes since the 1948 Road Show. Today the rubber-tired tractor has come into its own here, being standard equipment for scraper hauls in very rough ground, or on jobs with exceptionally steep grades. Rubber-tired equipment now shares with the crawler mechanism the credit for helping step up productivity of excavating and grading in highway construction and other works. Many jobs depend on fleets of these rubber-tired giants operating in well managed cycles at high speeds. Because of this wide acceptance, tremendous advancements have been made in the

See Page 118 for New Equipment Shown at Chicago

New Earthmoving Equipment is the "Contractor's Bargain"

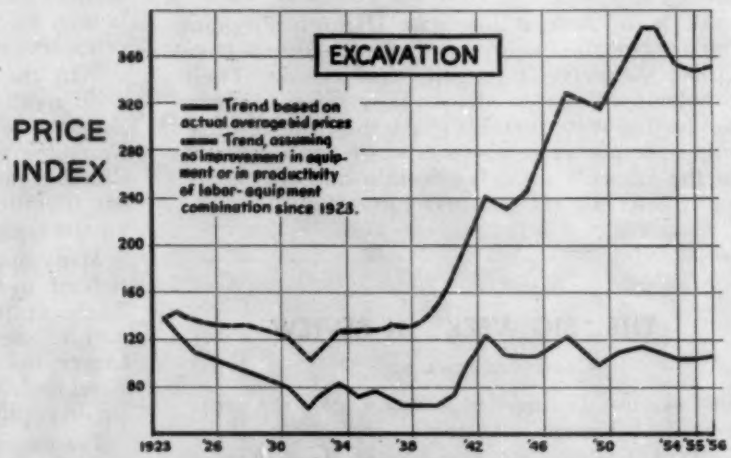


● **Increasing the productivity of labor by making available more powerful and efficient machines is a partial solution of the contractor's problem. This chart shows the effect of horsepower increase on investment and cost per hours.**



● **Horsepower increases have lowered cost per yard. The contractor is vitally interested in this final figure by which his managerial talents and profits are judged.**

Equipment purchase costs in the earthmoving field have risen, and so have hourly operating costs. But the newest models are designed to turn out such greater production that the contractor, upon analysis, often will find that he cannot afford not to acquire the new equipment. Here shown graphically by R. D. Evans, staff consultant of Caterpillar, is the picture of why the new machines shown by the manufacturers at the Road Show "give more for the money."



● **Effect of the new equipment on highway construction price (1925-1929 = 100). The upper line in this chart shows what would have happened to cost per yard costs if there had been no equipment or labor productivity improvement since 1923. The lower line shows the actual average bid price index.**

two-wheel and four-wheel tractors. Even the bulldozer now is often a mobile rubber-tired machine.

Tractors for drawing scrapers are not only built for more comfort and safety to the operator but many of the machines boast up to 50% more horsepower compared with 1948. Development of the turbocharger has been instrumental in providing the higher, more efficient horsepower in many instances.

Higher efficiency with less down time has been assured again, by improvements in metallurgy and welding techniques and the introduction of wide-base tires. The wide-base tire provides greater flotation under larger loads, while tubeless tires reduce down time for repairs. Productivity of wheeled scrapers under average condition has been increased 40% to 60% since 1948.

Motor graders represent another spectacular advance, although the machines are similar to the casual eye. The 1948 motor grader had just reached 100 hp maximum. Today's machine is 15% to 25% above that in power. Operator comfort and equipment dependability have been improved, while numerous attachments are now available for these machines providing a new versatility to the motor grader.

Dump units for off-road use share this advance. Since 1948, rear-dump trucks and buttom-dump

and rock wagons have increased from the 12 to 18 tons range to units which now will handle up to 35 to 50 tons. Shovel and dragline capacities have increased steadily, until the 3, 4 and 5 yd. and even larger machines are commonplace on heavy highway work today, whereas the 1½ or 2 yd. machine was standard for heaviest work in war days. This growth of excavator size has kept pace with the wagons and trucks with which they are teamed, so that the 30,000 to 50,000 cu. yd. production day on highway work is to be commonplace on heavy interstate work.

● *Major improvements in power* shovels, note: Caterpillar—again speaking for the entire industry—include extensive use of alloy metals to give greater strength with less weight, simplified and improved power-actuated controls, increased operator comfort, and the use of torque converters which save mechanical wear and improve cycle efficiency on the job.

These mechanical improvements are not limited to the heavy equipment. Smaller units such as rollers, front-end loaders and trucks, items used in everyday construction and maintenance work, and for minor construction projects, also feature many innovations and refinements. The front-end loader is no longer a small tool but one of the widest range from ⅜ yd. up to 10 yd. in bucket capacity.

Virtually all of the smaller equipment and trucks feature simplified and power-actuated torque converters, power steering and tubeless tires, not to mention greater operator comfort and safety.

Operator consideration has gone so far as to include air-cooled or air-conditioned cabs for trucks or grading equipment. Several hundred such units have already been installed and there is a lively interest in them.

Space will not permit a review of all of the innovations at the Show. But we might simply at this point ask ourselves: "What does all of this equipment mean to me?"

The answer will depend on the person who asks it. Undoubtedly there will be a continuing and accelerating problem of testing out and incorporating various machines into the fleet, and of capitalizing the changes in productivity and unit costs in preparing bids under today's intense competition for jobs.

The scarcity of first-class operators and other key employees will be an element in selecting equipment. The simplified controls and greater operator comfort and safety will help in recruiting and training new operators. By the same token, contractors should find that it requires considerably less time to train the thousands of new equipment operators that will be required in the next few years on the Interstate Highway Program. Some of this equipment "drives as easy as a Buick," and is as near foolproof as a machine can be made.

When it comes to bidding, the problem of the contractor will be to consider how much of the new equipment his competitors are utilizing, and what effect such equipment will have on their bids. Contractors who are too slow to take on the new machines will find themselves out of the running. On the other hand of course there will be the problem—and it is a formidable one—of financing, and finding profitable full-season work for these new machines. With profits on the average at a rather alarmingly low percentage of the gross for the highway and heavy contractor today, as reported by official statistic sources, the year 1957 will be a critical one in the evolution of highway construction techniques. Yet despite this tight condition, the analysts still agree that first cost is a secondary consideration in purchasing equipment. The problem is to make fullest use of the right equipment.

The problem of equipment utilization was well summed up during the Road Show week by R. D. Evans, a staff consultant of Caterpillar Tractor Company. Speaking before press, radio and TV representatives on the subject of "A Bargain in Grading," Evans said:

"No longer can the contractor 'questionate' his production and submit bids based on yesterday's figures. He must know the production and performance capacity of his new machines, as well as his men, in order to be successful in competitive bidding. In too many cases, bidding is below engineer estimates in spite of higher labor and material costs. Increasing the productivity of labor by making available more powerful, more efficient, more dependable equipment is a partial solution to the rising costs of equipment and labor."

● *In discussing bid prices, Evans* pointed out that the Bureau of Public Roads' average bid price for earth-moving has remained relatively constant at about 36c per cu. yd. for earth excavation over a period of years—during which period machinery prices have doubled and labor rates have tripled. The reasons for this accomplishment are several. One is the highly competitive nature of the construction business. Another is the ingenuity and aggressiveness of rugged individualistic contractors. A third is the improvement in methods and demand for greater equipment performance, and ready acceptance of new products which will promise this performance. It is in this latter area that the equipment manufacturers have made a substantial contribution.

Several authorities speaking at the Road Show agreed that competition among contractors is likely to increase rather than level off or decrease in the months ahead, under the stimulus of the rising volume of work brought to the bidding stage under the Interstate Program, supplemented by other Federal-aid highway projects and the heavy volume of general construction.

The role of the diesel engine was a conspicuous one at the Show. In the three decades since the diesel engine was put in a construction machine, diesel design has evolved brilliantly. Today's diesels come in a wide range of ratings and characteristics, enabling the equipment manufacturer to design his machines integrally with the power unit. Truly the diesel with its relatively cheap fuel and operating economy is the foundation of modern high-production, low-unit-cost earthmoving practice.

Equipment Distributors Hold Largest Convention

Rosy year seen in prospect as 3,500 delegates of U. S. and Canadian equipment houses attended the Road Show and held their own convention and supplementary equipment exhibit.

A MAJOR event during Road Show week in Chicago was the 4-day convention of Associated Equipment Distributors, "National Trade Association of the Construction Equipment Industry." Besides staging a separate exhibit at the Conrad Hilton Hotel, known as "Condex," the AED clan met in a succession of gatherings to analyze the subjects of equipment financing, distributor-contractor relationships, ales problems and techniques, and the business outlook.

President-elect of AED, L. Miner Doolen, of Telford Equipment Co., Lansing, Michigan, in his acceptance talk told of the work of the Association's headquarters staff and committee in solving industry problems. One effort is on the subject of tax relief for small businessmen, now being studied by AED's national affairs committee. Another committee is considering ways of helping members finance the booming new business in prospect in a tight credit market.

The growth of the cooperative relationship between contractors and distributors was told by Dwight W. Winkelman, of D. W. Winkelman Co., Inc., Syracuse, New York. Speaking as a past-president and long-time leader in the affairs of the Associated General Contractors of America, Inc., Winkelman noted the following developments:

- A survey of contractors and distributors is being made to bring out facts on current selling practices in construction machinery.
- The material supply outlook for the construction industry has been investigated by a special AGC committee. A construction volume nationally of $77 billion is foreseen by 1965 (including plant maintenance), compared with the present rate of $60.8 billion—a rise which might be seriously hampered by shortages. Joint committees have made reports which indicate a keen awareness of the problem, and many now feel that no serious shortage will be allowed to develop, and that the current cement and steel shortages will be taken care of soon by new mills under construction. Winkelman re-affirmed the ability of the contracting industry to meet any foreseeable demand for their services.

A review of the equipment financing situation was made by Frederick Salditt, vice president of Harnischfeger Corporation. He observed that while contractors, distributors, manufacturers, suppliers, engineers and government officials all have prepared for the huge road program, the equipment financing segment of the highway job has received adequate attention.

The special subject of concern today is the financing required while projects are in the course of preparation and execution. He said that great opportunities for constructive and profitable service are open to lending institutions specializing in the financing of construction and similar equipment, and more specifically to local and national commercial banks.

Construction machinery sales volume in 1956 added up to a record $2.5 billion, of which $2 billion was domestic business. Excluding military and direct sales, the nation's distributors handled over half of this volume. The financing involved, already a heavy item, will need to be stepped up in order to handle the sharp additional rise of business that will be required to implement the expanded federal highway program.

Quoting figures from the ARBA Task Force Committee's revised

• The Executive Committee of Associated Equipment Distributors—(Seated): vice president J. A. Benson, Benson Tractor Co., Houston, Texas; executive vice president H. D. Anderson, Rish Equipment Co., Bluefield, W. Va.; president L. Minor Doolen, Telford Equipment Co., Lansing, Mich., and vice president F. J. Fitzpatrick, Parker-Danner Co., Hyde Park, Mass. (Standing): Canadian vice president H. T. MacDonald, Kane Equipment, Ltd., Winnipeg, Manitoba; Ex-officio member of committee and immediate past-president, Stan Laskey, Northwestern Equipment, Inc., Fargo, N. Dak.; treasurer J. R. Borchert, Borchert-Ingersoll, Inc., St. Paul, Minn.; executive secretary P. D. Hermann of Chicago. Members of the Committee were installed at the Chicago meeting.

(1956) report, Salditt said that during the first five years of the expanded road program (1956-61), about 70,000 major equipment units valued at over $1 billion will be needed, over and above the machines required merely for replacement of present inventories. This means a 28% to 30% rise from the already-record industry production volume.

Sound financing practices, which will not fall as burdens on either the manufacturer or the distributor are needed here, said Salditt, who commented that poor distributor financing practices were discernible in some places in 1956. The manufacturer must schedule his production realistically, and the distributor must be discouraged from unrealistic and unsound sales and credit policies. Conversely, he should sell equipment on its merits and at its true value, and establish a background of adequate service and smooth relations with the manufacturer, said Salditt. Good business practices are needed now to prove to the bankers that the industry growth ahead represents an "opportunity and not a problem."

CIMA Elects Killebrew

New officers and directors were elected by the Construction Industry Manufacturers Association, the organization which put on the Road Show and which represents 95% of the industry's manufacturing capacity.

President: Clarence E. Killebrew, vice president of Clark Equipment Company, Benton Harbor, Mich.

1st Vice President: Boyd S. Oberlink, vice president, Tractor Group, Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

2nd Vice President: Henry Barnhart, vice president, Baldwin-Lima-Hamilton Corp., Lima, Ohio.

Treasurer: P. H. Birckhead, vice president, Bucyrus-Erie Company, South Milwaukee, Wis.

Directors (3 year term expiring 1960): P. H. Birckhead, vice president, Bucyrus-Erie Co., South Milwaukee, Wis.; C. R. Boll, vice president-general sales manager, Cummins Engine Company, Inc., Columbus, Ind.; James Drain, vice president, Joy Manufacturing Co., Pittsburgh, Pa.; G. A. Gilbertson, vice president, The Frank G. Hough Co., Libertyville, Ill.; D. W. Lehti, president, Linke-Belt Speeder Corp., Cedar Rapids, Iowa; Ray McLean, president, The Jaeger Machine Co., Columbus, Ohio; Carl R. Rolf, vice president, Pioneer Engineering Works, Inc., Minneapolis, Minn.

Director (2 year term 1959—to replace John M. Schoen): L. G. Schraub, vice president-general sales manager, Union Wire Rope Corp., Kansas City, Mo.

Steelman Heads ARBA

Julien R. Steelman, president of the Koehring Company, Milwaukee, Wis., was elected president of the American Road Builders' Association for 1957. He succeeds John N. Robertson, Director of Highways, District of Columbia.

Also elected at the closing session of the Chicago convention were regional vice presidents: J. E. McCracken, sales engineer, Bethlehem Steel Co., Bethlehem, Pa.; Nello L. Teer, Jr., Nello L. Teer Co., Durham, N. C.; Harold L. Plummer, chairman, Wisconsin Highway Commission, Madison, Wis.; W. A. Bugge, director, Washington state highway department, Olympia. Re-elected treasurer: Jennings Randolph, assistant to the president, Capitol Airlines, Washington, D. C.

New directors (4 years): Earl Coyne, county superintendent of highways, Brown County Highway Department, Aberdeen, S. Dak.; DeWitt C. Greer, state highway engineer, Texas state highway department; Howard S. Kaulbach, street maintenance engineer, Oakland, Calif.; G. Donald Kennedy, president, Portland Cement Association; Virgil Snow, director of sales, Euclid Div., GMC; George Stewart, publisher, Constructioneer magazine, South Orange, N. J.; and J. W. Thompson, Thompson-Arthur Co., Greensboro, N. C.

Heading ARBA's Contractors' Division for 1957 is E. V. Williams, of Williams Paving Co., Norfolk, Va., elected president. Vice presidents are Rudolph Kraemer, of Edward Kraemer & Sons, Plain, Wis.; and E. B. Cape, of Gulf Bitulithic Co., Houston, Texas.

Other division presidents elected were: *Materials and Services Division*—president, A. R. Taylor, Tar Products, Division of Koppers Co., Pittsburgh, Pa.; *Municipal and Airport Division*—James S. Devalin, Director of Public Works, Pittsburgh, Pa.; *Educational Division*—Radnor J. Paquette, Professor of Civil Engineering, Georgia Institute of Technology, Atlanta, Ga.; *Pan-American Division* — Tomas Guardia, chief engineer, Inter-American Highway, Panama section, Panama City, Panama; *County and Local Roads Division* —Lewis A. Lush, County Superintendent of Highways, Sangamon County, Springfield, Ill.

Maj. Gen. Louis W. Prentiss continues as executive vice president of ARBA at Washington headquarters, with Burton F. Miller, deputy executive vice president in charge of the Highway Division.

Another way to pick up heavy pipe

Construction of new 8 million dollar Information Center for historic Williamsburg, Va., required 5,000 lineal feet of drainage lines. This ingenious method was devised for moving 30-in. concrete pipe quickly and in quantity over the 60-acre site. Pictured is an International Drott TD-14 Skid-Shovel, equipped with special 36-in. forks bolted onto the bucket. Interchangeable forks have been found useful for many other construction jobs on the project as well, according to owner Colonial Williamsburg.

New '57 Fords

New T-750 tandem truck, 37,000-lb. GVW. High Torque 212-hp V-8 engine, 4-barrel carburetor and Master-Guide power steering, standard.

Only Ford Gives You All These Deep-Down Modern Features

NEW Styleside pickup bodies, standard at no extra cost. America's biggest pickup bodies! Built wider with all-steel rugged box-section corner reinforcements and recessed taillights. Side loading's far easier with full-width body.

NEW hydraulic clutch, standard in all models from pickups to tandems. Easier to operate—works like hydraulic brakes. Clutch and brake pedals are suspended type for extra driving ease!

NEW riding comfort! A completely new chassis suspension, roomy cabs with increased visibility, greatly improved riding and handling ease.

NEW power advances! New higher horsepower, new freer breathing, new higher compression, new Super-Filter air cleaner. New advancements from camshafts to carburetors. Modern Short Stroke design in every engine—V-8 or Six.

NEW Driverized cabs—completely new—stronger, roomier, smarter! New wider full-wrap windshield. New inboard cab step, new Hi-Dri ventilation, new easy-to-read instrument panel!

NEW chassis strength! New frames, up to 13% stronger. New sturdier axles! New higher capacity, easier riding springs!

More modern in more ways

...to cut your costs!

NEW F-600 2-tonner has higher horsepower and more rugged chassis construction. More payload capacity than any other 2-tonner.

NEW F-100 pickup with Styleside body, standard at no extra cost. Flareside body with wood floor also available. Both types in either 6½- or 8-foot body lengths.

Boldly modern! That's the *big* news in Ford trucks for '57. Modern styling outside—modern engineering through and through. They're the most *efficient* Fords ever built—engineered to cut your costs.

Look at Ford's new Extra Heavy Duty tandem models. They're at home with any load, anywhere! See the money-saving Medium Duty models . . . the most versatile trucks Ford has ever built. And Ford's new pickup with its smart-looking Styleside body gives you the biggest capacity in the half-ton field—*standard at no extra cost!*

Under the hood of a '57 Ford, you'll find important new advances in power. Engine breathing is freer, more efficient. And every engine—V-8 or Six—offers the cost-cutting benefits of Ford's modern Short Stroke design.

New Driverized Cabs are roomier, more comfortable than ever. And new structural design improvements make these the strongest Ford Cabs ever built.

Deep down it's a rugged truck, too! There's new toughness everywhere—in stronger frames, in sturdier axles, in higher-capacity springs.

One look at these completely new, boldly modern Ford trucks for '57 will make you want to see just what they can do. Contact your Ford Dealer now!

FORD TRUCKS COST LESS

. . . LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

. . . for more details circle 240, page 16

NEW OPERATOR-DESIGNED CAB

NEW AIR CLUTCHES

NEW TORQUE CONVERTER

THROTTLE-CONTROL OF LOADS

75 tons

LORAIN MOTO-CRANE® MODEL MC-875

NEW 2-LEVER "JOY-STICK" AIR CONTROLS

NEW "SHEAR-BALL" TURNTABLE MOUNTING

NEW SQUARE-TUBULAR-CHORD BOOM UP TO 200 FT.

. . . for more details circle 306, page 16

We don't have to label this the world's largest crane on rubber tires. Any crane user knows that no one (including ourselves) has ever before come close to a rubber-tire crane of this enormous lifting capacity.

This newest of a long list of Lorain Moto-Cranes embodies all the years of Thew-Lorain "know-how" from the origin of rubber-tire cranes — by Thew — in 1918. All the design features listed above are incorporated into this *big* crane for *big* crane users — plus a 12-tire Lorain-designed, Lorain-built Moto-Crane carrier, with 10 speeds to 20 m.p.h.

This is one rubber-tire crane that will really handle the *big* jobs. *There is nothing else like it!* See your Thew-Lorain distributor for all the details. Or write direct for the new "MC-875" catalog.

THEW LORAIN®

The Thew Shovel Co.
Lorain, Ohio

New Equipment Seen At The Road Show

Supplementing products announced in January Roads and Streets as being newly introduced at the Chicago Road Show (January 28-February 2, 1957). For additional new products currently announced by manufacturers but not in relation to the Show, see the Reader Service Coupon (p. 16) and What's New in Equipment (p. 138).

Utility Truck

A utility truck designed for all-purpose construction use was presented at the show by Crane Carrier Corp.

The truck is powered by a Cummins JT6B1 Diesel with 175 hp at 2500 rpm. Front axle carries 15,000 lb., the rear 50,000 lb.

The vehicle has two Prior "L" step fuel tanks of 50 gal. capacity each. It has an electric techometer, dual electric windshield wipers, oil temperature and fuel pressure gauges. Other accessories include air pressure gauge, low pressure indicator and large rear view mirror. Tires are 1100x20.

Utility Truck

For more information circle 108 on Service Coupon Page 16 and mail now.

34-Ton 6-Wheel Dumper

A new 34-ton off-the-road six-wheeler was shown by Mack Trucks, Inc., 1335 N. Front St., Plainfield, N. J. The four-wheel drive dumper has a heat-treated, stress-proportioned frame electrically fused into a single unit. The air-starting diesel engine developing 400 hp employs an air-assisted clutch of matching capacity. A four-speed over-gear transmission coupled with a single stage hydraulic torque converter allows maneuverability and stability despite the size of the truck.

For more information circle 109 on Service Coupon Page 16 and mail now.

3-Cyl. Diesel Engine

A 3-cyl. diesel engine, the "D.D." series, was shown by Hercules Motors Corp., Canton, O. The D.D. model 130 has a 3½-in. bore, 4½-in. stroke and displacement of 130 cu. in. The D.D. 149 has a 3¾-in. bore, 4½-in. stroke and displacement of 149 cu. in. The D.D. 169 has a 4-in. bore, 4½-in. stroke and displacement of 169 cu. in.

Cylinders are cast iron with precision type dry special alloy sleeves available for models 130 and 149. The crankcase is integral with the block. Lubrication is force fed by gear pump to all connecting rods, main bearings, camshaft and rocker arm bearings. The cylinder head has overhead valve arrangement. Piston is heat treated aluminum alloy.

The stripped weight of the engine is 550 lb.

Hercules "DD" Diesel Engine

For more information circle 110 on Service Coupon Page 16 and mail now.

27 Cu. Yd. Scraper

An all-new 27 cu. yd. version of its "Fullpak" scraper was introduced by LeTourneau-Westinghouse Co., Peoria, Ill.

In addition to the all new scraper, the Tournapull prime mover has been completely restyled. The combination has more than 50 "under-the-skin" improvements over the previous Model B. These mechanical advances include such items as a new tougher, longer wearing 16 in. double-plate clutch equipped with air assist for easier operation; a heavier, more rugged final drive shaft to withstand extreme shock loads; and a constant voltage transformer and new rectifier in the electric power system which provides high output even at low engine rpm.

The 27-cu. yd. "Fullpak" scraper has all the features which proved so successful on the Model "C". A longer blade cuts a wider swath. The broader, longer bowl interior eliminates the necessity of forcing dirt up in a high narrow column. Side sheets and floor of the bowl are clean and smooth, minimizing friction resistance. The floor of the scraper stays nearly flat in loading. With only a 1° floor tilt when the blade is on the ground, material slides easily without having to travel "up-hill" to get into the bowl.

For more information circle 111 on Service Coupon Page 16 and mail now.

Heavy Duty Back-Hoe

A new back-hoe to be mounted on the TL-12 and TL-12D Tractoloaders was displayed by Tractomotive Corp., Deerfield, Ill. The two levers which handle all boom, bucket and swing operations are located for easy operation

27 cu. yd. Scraper with Model B Tournapull

and are mounted over the control valve for positive action. Individual stabilizers are hydraulically controlled.

The boom pivots on replaceable, hardened pins and bushings. A fully enclosed, hydraulically actuated gear mechanism provides constant power and smoothness of swing. Bucket is standard 24-in. width with six detachable teeth. Pivot points are connected for easy installation and removal.

Swing arc is 180 degrees. The hoe can dig 12 ft. 8 in. below ground level. Digging reach from center line of swing axis at ground line is 15 ft. 6 in. Height of dump under tip of tooth is 8 ft. 2½ in.

Tractomotive Back-Hoe

For more information circle 112 on Service Coupon Page 16 and mail now.

6-Wheeler Chassis Unit

A new line of 6-wheeler construction chassis units designed for tandem-axle dump truck and cement mixer service was displayed by White Motor Co., Cleveland 1, O.

The model 9000 dump truck has an 8-cu. yd. capacity dump body with twin arm hoist. The 9064 is a 6½-yd. cement mixer with double channel, chrome manganese, heat-treated steel frame said to come through constant off-the-road service with no frame deflection. The new trucks are available with the White "Mustang" gasoline engine, 12-volt electrical system, wheelbase options of 158, 173, 180 and 186 in., front axle capacities up to 15,000 lb., rear axle capacities up to 44,000 l., power steering.

White Chassis Units

For more information circle 113 on Service Coupon Page 16 and mail now.

1500-Watt Generator

Two new 1500-watt generators brought to the show by Thor Power Co., Aurora, Ill., feature a vertical shaft design. With the vertical shaft, the entire weight of the generator is supported by tubular framework. Weight loads normally imposed on the main

Thor Generator

bearing shaft in conventional horizontal designs are shifted completely to the framework.

Since the engine main bearing and shaft only has to turn the armature—not support it as well—longer life and more efficient service is expected from the Thor entry, spokesmen said.

Powered by gasoline engines, the two new Thor models—EG-1.5A for alternating current and EG-1.5D for direct current—provide 13 amperes of 115 volt current.

For more information circle 114 on Service Coupon Page 16 and mail now.

2-Cycle Turbocharged Diesel

A new 2-cycle turbocharged diesel engine was presented by Detroit Diesel Engine division of General Motors, Detroit 28, Mich. The company says that the engine, a 6-110 series, has increased its horsepower from 300 to 375 with no appreciable increase in bulk, weight or operating cost.

The engine is turbocharged by utilizing its waste exhaust gases to drive a turbine turning an air impeller to supply a larger quantity of fresh air to the cylinder. The turbocharger is combined with the engine's side-mounted blower to provide greater efficiency.

For more information circle 115 on Service Coupon Page 16 and mail now.

Rubber Tire Tractor Scrapers

A new line of three high speed rubber tire tractor scrapers was introduced for the first time by Construction Machinery division of Clark Equipment Co., Benton Harbor, Mich. The new Michigan scrapers have capacities ranging from 8 to 20 cu. yd. struck, 10½ to 27 cu. yd. heaped. The engines are 165, 210, and 375 hp. and the weights of the scrapers go from 29,000 to 63,000 lbs.

All have power-shift transmissions, 90-degree power steering in both directions, hydraulic controls and on-the-road speeds of more than 30 mph. The three scrapers, known as the models 110, 210, and 310, also have positive forward hydraulic ejection and high apron lift.

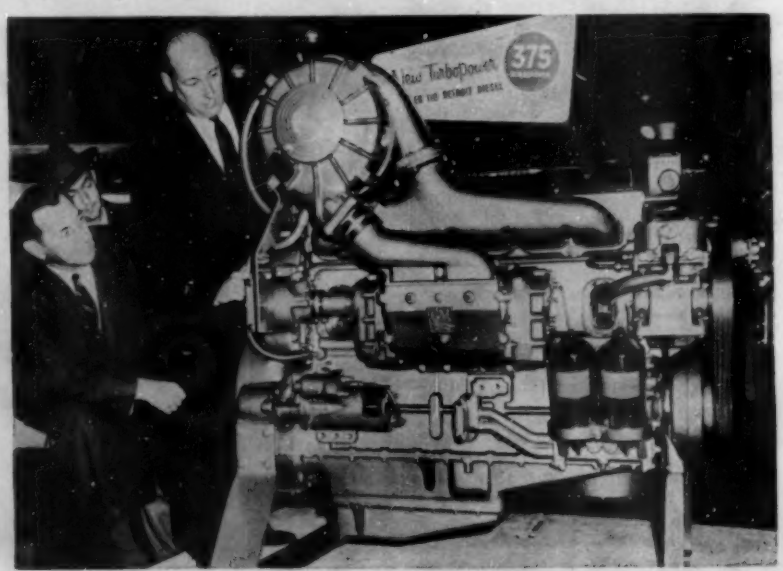
The machines use the same engine, transmissions, torque converters and planetary-wheel axles, thus providing interchangeability of components.

For more information circle 116 on Service Coupon Page 16 and mail now.

Portable Batching Plant

A new portable batching plant which can be disassembled into three completely equipped trailer units was exhibited by C. S. Johnson Co. of Champaign, Ill., a Koehring subsidiary. The new plant, called the Porto-Batcher, has an aggregate capacity of 39 cu. yd. heaped in four compartments, 46 cu.

(Continued on page 91)



Turbocharged Diesel Engine

Wide bowl-opening on Rear-Dump provides easy entry, big target for shovel, dragline, or conveyor loader. Units come in 11, 22, and 35-ton capacities.

Smooth, streamlined, unobstructed body dumping at 66° angle readily sheds sticky material.

Hauls to overburden dump are made at speeds up to 32 mph by this C Rear-Dump.

Big-tire haulers beat mud problem

A Canadian company had the problem of stripping 30 to 75-ft. layer of wet clay out of rock pockets. Soft and sticky with trapped-in moisture, this overburden was loaded by draglines, and hauled half a mile to waste dumps. Four C Tournapull Rear-Dumps were used to speed hauling.

Exceptional mud-ability

As owners everywhere have found, Tournapull Rear-Dumps go through mud which stops conventional truck-type haulers. On this overburden job, for example, these Rear-Dumps worked out of deep mud-holes in the pit and off dumps so soft a man could not walk through them. The exceptional mud-ability they showed is due partly to traction of big 21.00 x 25 low-pressure tires... partly to electric power-steer through geared kingpin which "walks" Tournapulls out of trouble... partly to exclusive differential which *automatically* transfers power from slipping wheel to wheel on firmer footing.

On rough haul-roads, Rear-Dumps with 5'6" diameter tires haul faster than trucks. The big tires grip and roll over the bumps, cushion machinery and operator from road shocks.

Turn around non-stop

These Rear-Dumps also work faster and with greater safety in narrow quarters than conventional haulers. They turn around in much less space. When bowl is raised, they shorten wheel-base to turn non-stop in an area about 1/3 less their overall length. This maneuverability speeds haul on narrow roads, reduces spotting time at shovel and dumps.

Dump fast and clean

Practically no clean-up is needed on the dump. With front-wheel drive, Rear-Dumps back safely to edge of bank. Bowl swings behind and below rear wheels... loads fall free and clear over the edge, with little spillage, seldom call for clean-up.

Ask your LeTourneau-Westinghouse Distributor to show you first-hand how Rear-Dump advantages can pay off on your work.

Rear-Dumps now available with optional tailgate.

Tournapull—Trademark Reg. U.S. Pat. Off. R-982-G-bw

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

from Atlanta to the Land of Lakes

VISQUEEN white opaque being placed on Minnesota Highway 169, south of Shakopee.

Contractors everywhere have found the way to substantial savings in highway construction with VISQUEEN film.

Four mil VISQUEEN film in widths up to 32 feet is rapidly replacing other materials as a curing blanket. The reason? 80% less weight than other curing blankets —no absorption of water—lower first cost—many more reuses—concrete 10% to 19% stronger.

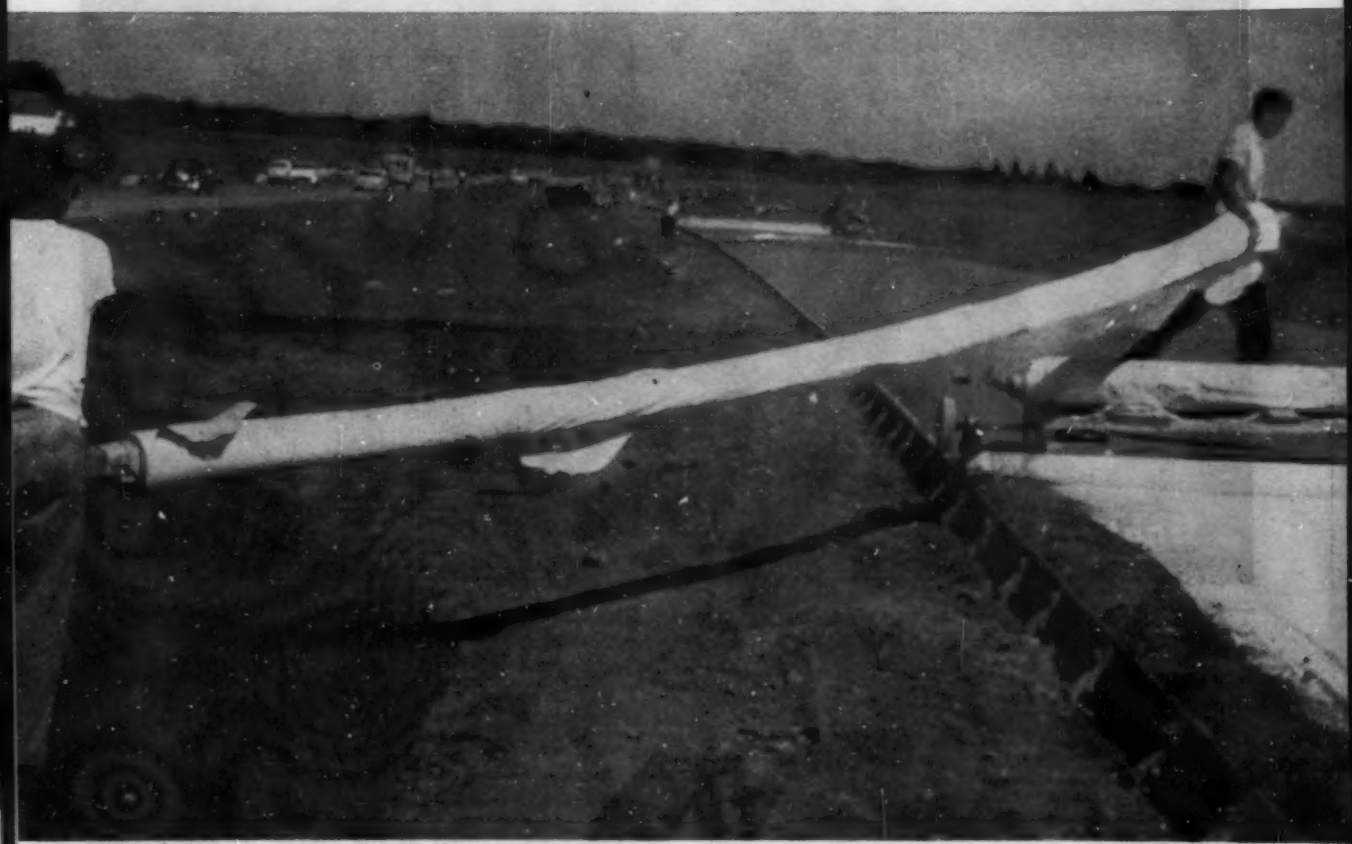
VISQUEEN provides quick protection for machinery and prepared roadbed when showers break—and there's no added cost. Keeps frost out of roadbeds on cold fall and winter nights.

There's nothing like VISQUEEN for curing concrete! Look at the proof.

Here's why you will save important money when you cure with VISQUEEN film:

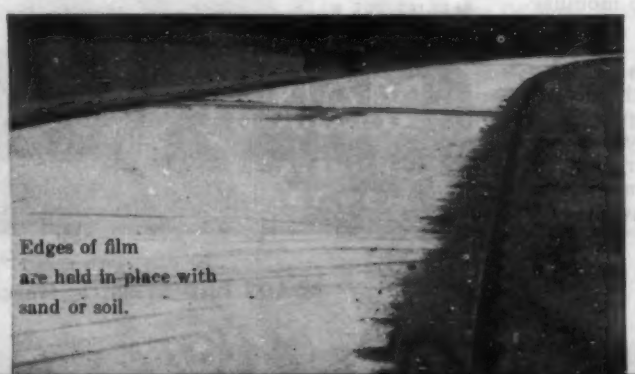
1. Much lower initial cost.
2. Much less weight. Four mil VISQUEEN film weighs only one fifth as much as other widely used material. 1000 square feet weighs less than 20 pounds.
3. Much easier to handle. Will not absorb water. 300 foot rolls 24 feet 4 inches wide can be unrolled and rerolled by two men. No time-consuming, costly drying needed.
4. Much greater reuse. In Minnesota a 300 foot roll 24'4" wide was reused seventeen times. Contractor says he expects at least six more reuses.
5. Much stronger concrete. State testing laboratories compare cores from same immediate areas where white opaque VISQUEEN and a competitive material were used. In every case cores from concrete cured with VISQUEEN surpassed others by margins that ranged from 11% to 19%.

VISQUEEN film used as curing blanket on Atlanta expressway. Two men unroll it from steel pipes. After use, film is rewound on same pipes.



On Highway 169, south of Shakopee, Minnesota two men easily handle 300' roll of four mil white opaque VISQUEEN rolled on a 3" wooden core. This piece of VISQUEEN was used seventeen times during 1956 road-building season—then stored for reuse in 1957.

VISKING COMPANY Division of Union Carbide and Carbon Corporation
PLASTICS DIVISION World's largest producers of polyethylene sheeting and tubing
P. O. BOX 1410 TERRE HAUTE, INDIANA



Edges of film are held in place with sand or soil.

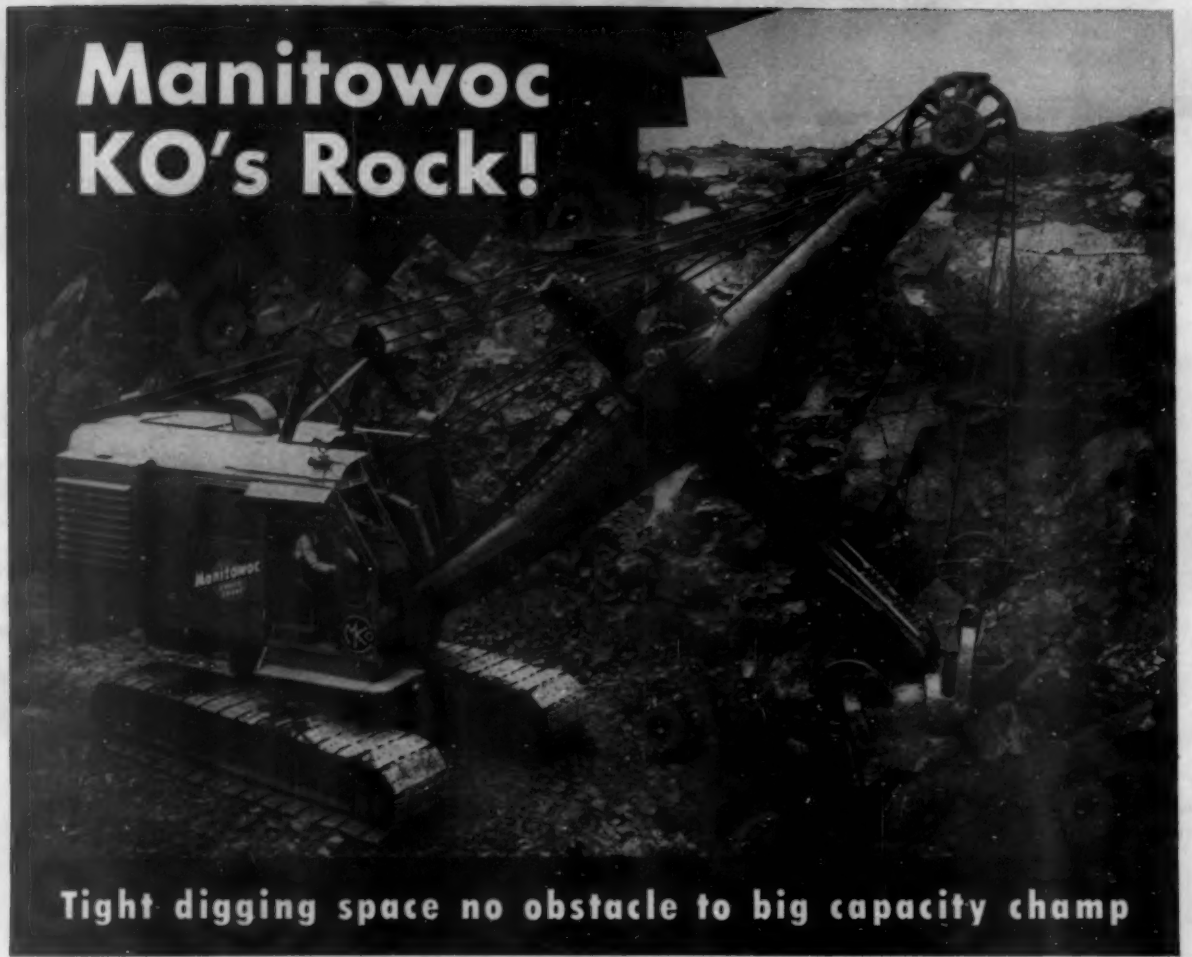
information request tag

VisQueen®

clip this tag—RS3
attach to letterhead, mail.

. . . for more details circle 315, page 16

Manitowoc KO's Rock!



Tight digging space no obstacle to big capacity champ

Tough volcanic rock has met its master in the rugged 2½-yd. Manitowoc shovel used by Morrison-Knudsen, Inc. during one construction stage of Dalles Dam. The job involves relocating 14 miles of road bed for the Seattle-Portland-Spokane Railroad. Well over a million yards of volcanic rock have to be excavated before the project is finished, and this unit will be on the job till the end. Working in extremely narrow quarters, the Manitowoc 3500 is moving over 2,000 yards daily of the unusually hard-to-handle heavy rock. Torque converter power assures smooth, steady digging; positive steering is a must in the tight working space; an all-cast, manganese Esco dipper (optional) is specially rugged for tough rock work. Here's a rough job calling for a machine having the guts and power of a real rock shovel, with the mobility of a small excavator.

Extremely clean, simple design of the Manitowoc shovel produces more bite at the dipper because no power is wasted. Only 17 gears and pinions are in the entire machine, with only working gears turning to get full capacity from every unit of horsepower. Exclusive sliding pinion arrangement uses one set of clutches to drive travel, swing and boom hoist.

Shovel boom is high-strength alloy steel . . . built to take severe twisting and bending under tough digging conditions. Twin dipper sticks are of reinforced box section design . . . roll through saddle blocks on four adjustable rollers, achieving full utilization of power.

Simple, fool-proof air controls help eliminate operator fatigue. Smooth torque converter power makes for a more efficient operating cycle. There's no stalling of the motor, no over-loading . . . power is perfectly balanced to the load. You get the most efficient use of your machine with torque converter power . . . pioneered by Manitowoc in excavators.

Take advantage of Manitowoc's superior features. Your helpful Manitowoc distributor can fill you in on the complete story. Call or write him today for literature and specifications!

Manitowoc Engineering Corp., Manitowoc, Wis.

MANITOWOC
SHOVELS 1-5½ YD. Speedcrane CRANES 20-100 TON

. . . for more details circle 277, page 16

New Equipment At The Road Show

(Continued from page 86)

yd. with 12-in. side boards. Compartments have 141-in. minimum width for charging with front-end loader, can be furnished with pivoted distributor for belt conveyor charging.

The plant has automatic interlocked batch control with repeater. The operator sets weighbeams and water pointer for quantities of materials per batch, sets repeater for number of batches desired, presses batch button and unit automatically weighs and discharges proper number of batches, then stops.

The Porto-Batcher breaks down into three units, each with wheels, fifth-wheel plate or towing eye, brakes, lights and American Trucking Association standard electrical connector. Electric or air-operated hydraulic brakes available on batcher trailer, electric only on elevator and discharge conveyor trailers.

Johnson Batching Plant

For more information circle 117 on Service Coupon Page 16 and mail now.

Front End Loader

A new front end loader exhibited by Eimco Corp., 634 S. 4th West St., Salt Lake City, Utah, has a dumping height of 11½ ft., can reach over a 14-ft. bin, hopper or railroad car to discharge its cargo, according to the company. The machine operates in 9½ ft. of head room, is said to be adaptable to cleaning out any area where strong downward pressure is necessary. Dozer blades, form lifts and other attachments can be fitted to the loader.

Eimco Front End Loader

Blaw-Knox Paver

Eimco also introduced a 36,000 lb. tractor-dozer which allows shifting from full forward to full reverse speeds with safety and control. Operator has full vision of the blade. Torque converter eliminates killing of the engine from overloading. The company also showed a tractor-excavator capable of up to nine yards a minute.

For more information circle 118 on Service Coupon Page 16 and mail now.

30-Ton Off-Road Truck

A 30-ton off-road hauler, The LW-30, introduced by LeTourneau-Westinghouse Co., Peoria, Ill., has no springs, no grease fittings, and no conventional axles. It features air suspension, short wheelbase and unique final drive design.

Four big pistons, acting like giant shock absorbers are used instead of springs. Conventional axles have been eliminated by the "Hydair" suspension system. There are no tie rods or exposed steering linkage. The entire steering system is protected within or above the frame line.

To make day-to-day servicing fast and simple, chassis grease fittings have been completely elimtnated. Special bearings lubed and sealed at the factory

LW-30, 30-Ton Off-Road Hauler

need regreasing only if disassembled. Repair time is speeded up too, by easy accessibility and quick individual removal of major components without the need for removing other elements. The LW-30 has a 128-in. wheelbase; is extremely maneuverable.

For more information circle 119 on Service Coupon Page 16 and mail now.

Half-Size Asphalt Paver

A new black top paver was shown by Blaw-Knox Co., 300 Sixth Ave., Pittsburgh, Pa. The paver is claimed to lay 5610 sq. ft. of asphalt base in nine hours, finishing in 10 separate level areas each containing 561 sq. ft. The machine, designed for work on walkways, driveways, playgrounds and city streets, is 14-ft. long. Its 10-ft. wide hopper has a capacity of four tons. A Continental F-162 gasoline engine provides power for six working speeds and speed of approximately 8 mph. The screed, which has a vertical tamping action of 1000 rpm at 1300 engine rpm, is hydraulically controlled.

For more information circle 120 on Service Coupon Page 16 and mail now.

Bulk Cement Transport

An airslide bulk cement transport delivering 100 barrels in under ten minutes on ¼ lb. of air was exhibited

Fruehauf Cement Transport

by Fruehauf Trailer Co., 10940 Harper Ave., Detroit 32, Mich. The truck is lightweight, has a low center of gravity, and can be built to order for rear or center discharge. It is 18-ft. long, 10-ft. 10-in. high with a 7-degree slope, can be adapted for semi or train operation.

For more information circle 121 on Service Coupon Page 16 and mail now.

Full Power Shift Tranmission

A transmission designed for earth-moving equipment, heavy construction machinery and similar units was introduced by Rockford Clutch Division of Borg-Warner Corp.

The transmission can be shifted while engine is developing full power.

(Continued on page 122)

WHEN TO REPLACE YOUR EQUIPMENT

The "Metre" Method, as proposed by Caterpillar Tractor Co. Second of two articles on the subject; see analysis by Professor Puerifoy in Roads and Streets, Nov. '56.

When should an old machine be replaced? How can it be determined that it is more economical to replace present equipment with a new machine particularly when the present machinery appears to be operating satisfactorily?

These are questions posed quite frequently in the minds of many owners. And the replies appear to have been as numerous as the people seeking answers. Roads and Streets published an article on this subject, "When Should Equipment be Replaced," in November, 1956.

Several methods are now in use in the field to determine this economical time to replace. One owner pointed out that when a tractor reached an age of three years it became a headache. He didn't like headaches, so he replaced his tractor every three years. Some companies replace their tractors just before a major overhaul is needed. Another method is to replace older machines whenever there seems to be some extra money in the treasury.

The "Metre" (Most Economical Time to Replace Equipment) Method has been developed by Caterpillar Tractor Co. to aid the equipment owner to detect the point of lowest possible hourly operating costs. This important factor can be removed from the realm of intuition and evaluated on a dollar and cents basis. The accuracy, of course, is dependent upon the specific data the owner can supply from his own records. This method was primarily worked out for crawler tractors, but it can be applied to other types of equipment.

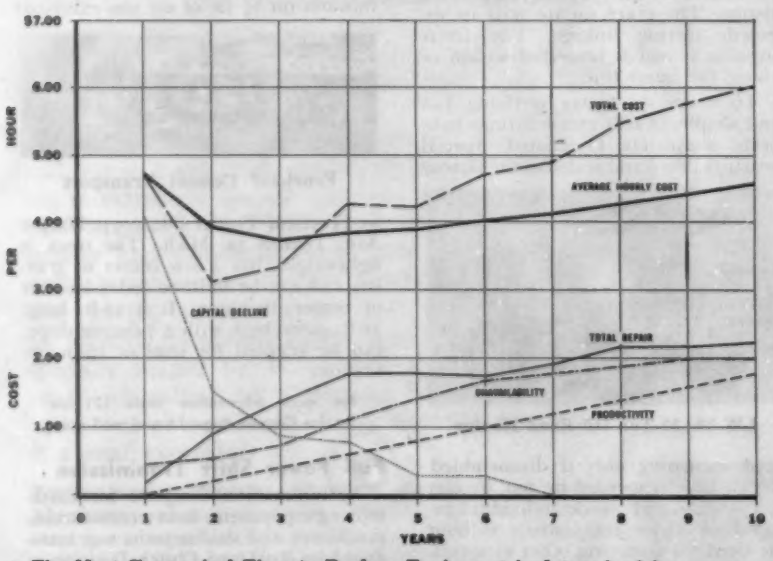
Before getting into the mathematics of economical replacement, it is important to review some of the factors to be considered. The first and most evident factor is major repair and overhaul costs. But of equal importance though not so apparent, are the costs of productivity, unavailability and capital decline.

• *Major Repair and Overhaul.* As the tractor, or any other piece of equipment, gets older, the repair cost gets higher. For example, the engine would require only rings, liners and a valve job on the first overhaul, but on the second might require new crankshaft, bearings and pistons, plus the same items as on the first. A similar pattern would apply to the cable control, master clutch, steering clutches and other components serviced as a whole. Attachments can be included, and tires substituted for track components on rubber tired units.

It's true that one of the most difficult factors to measure is productivity. Improvements are constantly being made. Tractor horsepower has increased approximately 20 percent in the last ten years.

(Continued on page 97)

METRE METHOD FACTORS



• The Most Economical Time to Replace Equipment is determined by averaging the total costs up to that time for each year. As it can be seen, the costs reach the lowest point around the third year, then start increasing. Every year after that time the machine is operated at a higher average cost per hour.

TOTAL REPAIR is the first item to be considered in determining the most economical time to replace equipment.

PRODUCTIVITY decreases in a straight line, due to the increased ability of new equipment.

UNAVAILABILITY increases as a machine gets older, requiring more frequent adjustments and repairs.

CAPITAL VALUE decreases each year.

Combining the above four factors indicates a TOTAL COST for the machine reaches a low point at the end of the second year. Yearly costs then start to rise as the machine gets older and less efficient.

AVERAGE HOURLY COSTS determine The Most Economical Time to Replace Equipment. Note that these costs reach the lowest point around the third year, then start increasing. Each year after that time the machine is operated at a higher AVERAGE COST per hour.

CARBO-JET: The quick, efficient method to darken concrete

CARBO-JET reduces glare, improves appearance of roads, walks, curbs, center islands, patios, driveways and runways.

CARBO-JET is a specially formulated carbon black, dispersed in liquid form. It is by far the easiest, and most economical way to introduce gray-to-black shades in mortar and plain or air-entrained concrete.

CARBO-JET disperses faster than ordinary cement colors. A uniformly-colored batch takes much less mixing time. There is no streaking, no color variation. Unlike ordinary colors CARBO-JET does not affect the air content of air-entrained concrete.

MANY ADVANTAGES. CARBO-JET cuts down the danger of glare. On highways and roads, traffic markers stand out. The dark color absorbs and holds heat. Ice and snow melt faster and surfaces dry in less time. The appearance of concrete is improved as oil stains are less visible.

Send for the Technical Data on CARBO-JET today.

CARBO-JET

A Product of Sonneborn RESEARCH

Since 1903 manufacturers of quality building products.

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Building Products Division—Dept. R3
404 Fourth Ave., New York 16, N. Y.

☐ Send information on CARBO-JET—the better way to darken concrete and mortar.

☐ Also send *FREE* copy of your helpful 128 page Building Construction and Maintenance Handbook.

NAME .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

. . . for more details circle 337, page 16

YOU GET

"multiple-

from one basic

Giving regular "carry-type scraper" action in *Bullclam* position, this TD-9 Four-In-One grades on-the-go with inch-close accuracy—to reduce a builder's landscaping cost. As a Bullclam, the Four-In-One can grade, strip, or spread with precision, typical of its multiple use-range.

Carrying a big load of mill-waste to the pile, this TD-9 *Skid-Grapple* indicates its usefulness to a contractor—on such jobs as brush-stacking on land-clearing jobs, or low-cost handling of posts or poles. The exclusive top grab-arm under separate control lets you clamp on to the load securely.

This *Rock Fork* of super-strong alloy steel is built especially for handling the weight and to withstand the abrasion of loading rock. This TD-14 Rock Fork is digging up and loading rocks and boulders to rip-rap a big earth-fill dam near Jacksonville, Texas. Rock Fork works with the 3 larger Skid-Shovels.

It's simple to install this heavy-duty, ground-ripping scarifier attachment. The third valve, standard equipment on all International Drott Skid-Shovels, furnishes control power for scarifying. This high-lift scarifier has deep penetration, and strength to shatter hard materials.

-machine" usefulness

International Drott outfit!

You get the utility of four multiple-duty machines for one moderate investment in an exclusive International Drott Four-In-One. At a fingertip touch of the "machine-selector" lever, you instantly get your choice of four multiple-duty machine actions!

You get famous full-capacity *Skid-Shovel* excavating and loading performance. Or regular "carry-type scraper" action, in *Bullclam* position. Or as a *clamshell*, the Four-In-One gives you a load-gulping bucket—with hopper-high, bottom-dumping ability. And with clam-lip raised, you've got a responsive earth-rolling *bulldozer! You get versatility unlimited!*

And the identical International Drott *exclusives* that inspired Four-In-One design are also behind the development of an unmatched line of special-purpose attachments.

For example, exclusive concrete-smashing pry-over-shoe break-out action makes ideal boulder-bucking tree-grubbing power. Exclusive bucket-heaping ground-level roll-back is "just the ticket" for positioning Skid-Grapple loads of logs to semi-skid. And exclusive shock-swallowing Hydro-Spring constantly protects *all* Internaticnal Drott equipment from impact!

Prove to yourself what amazing job-getting ability and money-saving capacity you command—with one of the four sizes of basic International Drott units—and whatever low-priced fast-switch attachments you need. Figure up the huge savings you make in machinery investment—and in hauling time and wages—getting multiple-machine usefulness. Ask your International Drott Distributor for a demonstration!

With *Grubber Blade* attachment instead of Four-In-One, or regular bucket, this International Drott applies the tremendous force of pry-action break-out. And a tough old oak tree with 22-inch trunk is uprooted with record speed—in a Vermont land-clearing project!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

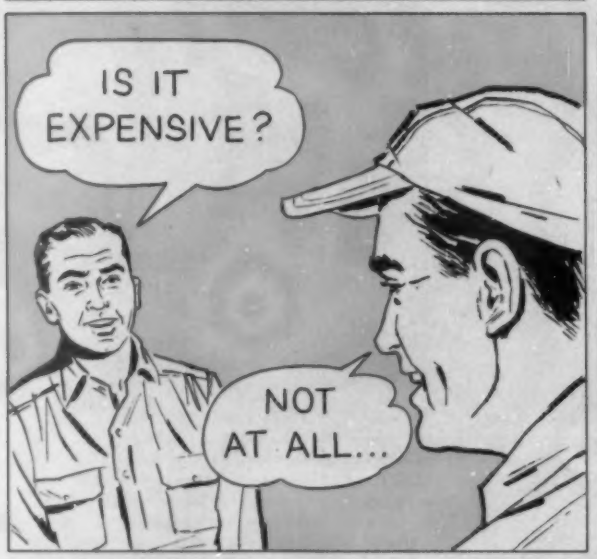
INTERNATIONAL® DROTT®

Remove bucket and attach the *Bullangledozer*, and you have a real ditching, sloping, or shoulder-dressing outfit. Angle blade to either side or tilt as desired. On straight dozing, this versatile blade does heavy digging or fine grading under accurate hydraulic "radius control."

. . . for more details circle 323, page 16

THE CASE OF

THE IDEA THAT SAVED TWO DAYS



--YOU PAY ONLY FOR THE PARTS AND REPAIR SERVICE TO PUT YOUR CLUTCH IN THE SAME FIRST-CLASS SHAPE AS THE EXCHANGE UNIT. THEN YOUR REBUILT ASSEMBLY GOES INTO OUR EXCHANGE STOCK.
EXCELLENT IDEA! GO AHEAD...

THAT AFTERNOON
SURE AM GLAD I FOUND OUT ABOUT YOUR PARTS ASSEMBLY EXCHANGE PLAN, ART!
WE HAVE OTHER ASSEMBLIES ON HAND TOO, JIM. IT'S AN IDEA THAT REALLY SHORTENS DOWN TIME!

CATERPILLAR*
"Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.
CAT CARE FOR LONGER WEAR
LET ME HELP KEEP YOUR CAT* EQUIPMENT ON THE JOB!
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

. . . for more details circle 219, page 16

	YEARS									
	1	2	3	4	5	6	7	8	9	10
Hours Operated Each Year	1800	1800	1800	1500	1500	1500	1500	1500	1500	1500
Total Hours at End of Year	1800	3600	5400	6900	8400	9900	11400	12900	14400	15900
Major Components	REPAIR AND OVERHAUL COST PER HOUR									
Engine	0	0	0	.12	12	12	12	23	.23	.23
Steering Clutches	0	0	.09	09	.09	.09	09	.09	.09	09
Brakes	.07	07	07	.07	.07	07	.07	.07	.07	07
Tracks	0	62	62	62	62	62	.62	.62	62	.62
Cable Control	0	03	03	.07	07	.06	06	.07	.07	.07
Roller Frame & Sprocket Group	0	0	38	38	38	38	.49	49	.49	55
Master Clutch	0	0	0	0	0	0	.06	.06	06	06
End Bits & Cutting Edges	08	.08	08	08	08	08	.08	.08	08	.08
Transmission & Final Drives	0	0	0	14	14	.14	.14	.29	.29	.29
Guards, Hoods, Fenders	0	09	09	18	18	18	.18	.18	.18	.18
TOTAL REPAIR & OVERHAUL COST/HR	.15	89	1.36	1 75	1.75	1 74	1.91	2.18	2.18	2.24
PRODUCTIVITY COST PER HOUR	0	20	40	60	.80	1 00	1.20	1 40	1.60	1.80
UNAVAILABILITY COST PER HOUR	40	50	70	1.10	1.40	1.70	1.80	1.90	2.00	2.00
CAPITAL DECLINE COST PER HOUR	4.22	1.55	.89	.80	.27	27	0	0	0	0
TOTAL COST PER HOUR *	4.77	3 14	3.35	4 25	4.22	4.71	4.91	5 48	5.78	6 04
AVERAGE HOURLY COST IF TRACTOR IS REPLACED AT END OF GIVEN YEAR	4 77	3 95	3.75	3.86	3.93	4.04	4 16	4 31	4.46	4.61

* Excluding operator fuel, grease, etc

● Work sheet for determining economic life on track-type tractors.

REPLACING YOUR EQUIPMENT

(Continued from page 92)

While horsepower is not directly proportional to increased production, other improvements, such as hydraulic-boosted controls, better visibility and better stability, increase at about the same rate as horsepower.

If an old tractor is used, it should be charged with the difference in ability to produce between it and a new machine. The old tractor should be charged for its inability to produce as much as the new tractor.

This charge should not be made in all cases. If the old machine can supply all the needs of a crusher plant, a new machine can add no productivity. In this case productivity is governed by the unit it is working with, rather than the tractor itself.

This charge may be made in several ways. If it is working alone, a fair, although conservative, way would be to charge the tractor with the cost of renting a machine to make up the lost production. If the tractor is pushloading scrapers, it should be charged with the cost of renting a push tractor and scrapers to make up this lost production.

● *Availability.* The machine should also be judged on the basis of availability, or the number of hours the machine is down in comparison to the number of hours it could have worked. This should not include time for major overhauls, but should include any delays for repairs and greasing.

A new tractor will usually be available about 96 percent of the time. The older a machine, the more time will be required for adjustments and repairs. To charge a tractor for not being available, compute the cost of renting a comparable size machine during the time the tractor is not available.

● *Capital Decline.* Equipment owners do not replace equipment every season, usually, because the difference between original cost and trade-in value would cause prohibitive operating costs. This difference is called "Capital Decline." This cost, the difference between purchase price of a current machine and true value of the existing machine, should be charged to the

(Continued on page 104)

Where Are We in

Notable progress has been made in revolutionary new techniques which greatly increase the productivity of highway engineers. Here reviewed are the types of computers best suited for highway work, and their operating principles, together with an outline of the applications being made to speed computations for surveys, grades, earthwork, geometric and structural design, traffic studies, and other engineering tasks.

By L. R. Schureman

Highway Engineer, Bureau of Public Roads, Washington, D. C.

At the Highway Research Board's 35th Annual meeting (January, 1956), the Committee on Highway Organization and Administration, conducted a symposium on highway engineering manpower. This meeting stressed the potentialities of the electronic computer as a means of increasing engineering productivity.

At that time, exploratory work in the Arizona and California highway departments and the Bureau of Public Roads had just begun to produce tangible results. In Arizona, a method had been developed and adopted for the computation of centerline grades on a UNIVAC 120 punched-card electronic computer as the initial step in the mechanization of earthwork computation. In California, methods had been developed and adopted for performing survey and earthwork computations on an IBM 604 electronic calculating punch. (Subsequently an IBM 650 electronic computer was installed and these methods were adapted to it.) The Bureau of Public Roads, in collaboration with the Bendix Computer Division of the Bendix Aviation Corporation, had developed a method for the computation of earthwork quantities on a BENDIX G-15 electronic computer which was demonstrated at the American Road Builders Association convention at Miami Beach in January, 1956.

Presented at the 36th annual meeting of the Highway Research Board, Washington, D. C., January 7-11, 1957.

From these initial applications, highway engineers have been quick to recognize the possibilities in electronic computers, and during the past year interest has grown tremendously. Regional conferences of officials and engineers representing the state highway departments, the Bureau, computer manufacturers, consulting firms and contractors' organizations were held in Chicago, Albany and Atlanta. At these conferences, electronic computers and their application to highway engineering operations were explained, demonstrated and discussed.

Engineers in the state highway departments and in the BPR have been, and are devoting much time and effort to further exploration and a number of additional applications have been developed or are in process of development. This paper is essentially a report on these applications and on other aspects of computer use.

VARIOUS COMPUTER TYPES

The type of electronic computer best suited to highway engineering work, and the one which has been used in all of the applications developed thus far, is the general-purpose digital computer. As its name implies, the digital computer works with digits or numbers. The other type of electronic computer is the analog computer in which quantities or physical conditions such as pressure, temperature or flow are represented by analogous electrical quantities.

The electronic digital computer is simply a

Electronic Computer Application

computing machine which can add, subtract, multiply and divide. However, in addition, it can follow a predetermined continuos sequence of operations without human intervention, it can compare two numbers and follow either of two courses of action depending upon which number is the larger, and it can store numbers in its "memory" for use as needed in the computation. These characteristics, together with its fantastic speed of operation, make the electronic digital computer an extremely valuable device for the solution of problems involving large masses of data or large numbers of mathematical operations.

While the desk calculator can complete about four or five arithmetic operations per minute, a medium-sized electronic computer can complete many thousands of such operations in a minute. It can do this 24 hours a day, month after month, with an average down-time of only about 10 percent.

In order to use the computer for the solution of a problem, it is necessary to feed into it a prepared series of detailed instructions which governs its sequence of operations in solving the problem. This is called a program. Depending upon the complexity of the problem, the preparation of the program may take weeks or months. However, once completed and checked, the program, expressed in coded form on tape or cards, or wired on control panels, can be placed in the computer in a very short time and used over and over again, year after year, whenever that particular kind of problem is to be solved. As many programs as desired may be developed for the same computer so that it may be used at 9:00 a.m. for earthwork computation, at 9:30 a.m. to produce a payroll, at 11:00 a.m. for a structural design, and so on.

COMPUTER PROGRAM

In the development of a computer program, the problem first must be carefully defined and analyzed. It is then broken down into its component parts and these parts are further broken down into elementary mathematical operations, all arranged in proper sequence for the solution of the problem. This sequence, expressed in the form of a flow chart or a precise step-by-step written procedure, is then translated into "machine language" so that the program can be used by the computer. It is then carefully checked on test problems and released for use.

In the design of a specific project, the knowledge, imagination and judgment of the engineer used in devising a design proposal must of course remain with the engineer—it cannot be mechanized. The value of the electronic computer lies in its use in the analysis and evaluation of the design proposal or of alternate design proposals. It cannot replace the engineer, but it can serve very

(Continued on page 103)

• A Burroughs electronic computer, being used in the office of DeLeuw, Cather & Company, consulting engineers, Chicago. In the foreground here, is displayed an Abacus, most primitive form of counting device, which helped dramatize to the office staff the great advance represented by the latest electronic equipment.

Big production: at the Camp Dennison, Ohio, plant, a 2¾-yd. Michigan loads out a heaping bucket load of frozen aggregate. Power-shift transmission is standard equipment—cuts seconds off every cycle between truck and pile.

$76,000* buys *one* 2¼-yd. truck crane or *four* 2¾-yd. Michigan Tractor Shovels . . .

Here's why this Ohio firm bought the four Michigans

Ohio Gravel Company operates five plants around the perimeter of Cincinnati. Until a short time ago, ½-yd. and ¾-yd. clamshells and shovels handled all loading from stockpiles. When it became apparent that the Miami plant (300 t.p.h. capacity) did not have adequate loading capacity, Ohio Gravel asked for bids on a special 2¼-yd. mobile crane. According to Walter Flach, V. P. Production, they recognized the need for bigger bucket capacity and better mobility between stockpiles. Bids on the crane ran from $65,000 to $76,000—a substantial price to pay for increased capacity in *only one of the five plants.*

Had to leave the demonstrator

At this point Bode-Finn Co., the local Michigan distributor, got permission to demonstrate a 2¾-yd. Michigan Tractor Shovel at the Miami plant. The "demonstration" lasted two weeks—that is, Ralph Hautman (Miami superintendent) wouldn't

*Current list price F.O.B. factory for four 2¾-yd. gasoline Michigan Tractor Shovels.

let them take the demonstrator away until a permanent machine was delivered. Before the new Michigan even arrived, Ohio Gravel Company bought three more for other plants. *The total cost of the four Michigans was approximately the same as the one crane.*

Loads as much as two cranes

At the four plants with Michigans, the superintendents agree that one Michigan loads trucks as fast or faster than two ¾-yd. clamshells. With widely separated stockpiles, the Michigans move around the yards as fast as the incoming trucks—24 mph top speed. They consistently get heaping bucket-loads. Power-shifted cycles between pile and truck average about 40 seconds; it takes 4 minutes or 6 bucket-loads to put 19 tons into a dump trailer (see picture).

A typical heaping bucket-load of graded bank run comes up well over the 2¾-yd. rated bucket capacity. Digging bank run, the Michigan handles approximately 5½ tons per bucket-load.

Handling clean-up work in its spare time, the Michigan eliminates stockpile contamination. Unlike the clamshells which formerly handled the job, the Michigan does not pick up dirt as it cleans up around the piles.

More profits for producer and trucker

Faster travel, faster cycles, bigger bucket-loads obviously make more profits for producer and trucker alike. Ohio Gravel Company recognized this fact when the first Michigan was demonstrated. Your own Michigan distributor will give you this same kind of proof. A chance to demonstrate is all he asks—*you name the job.*

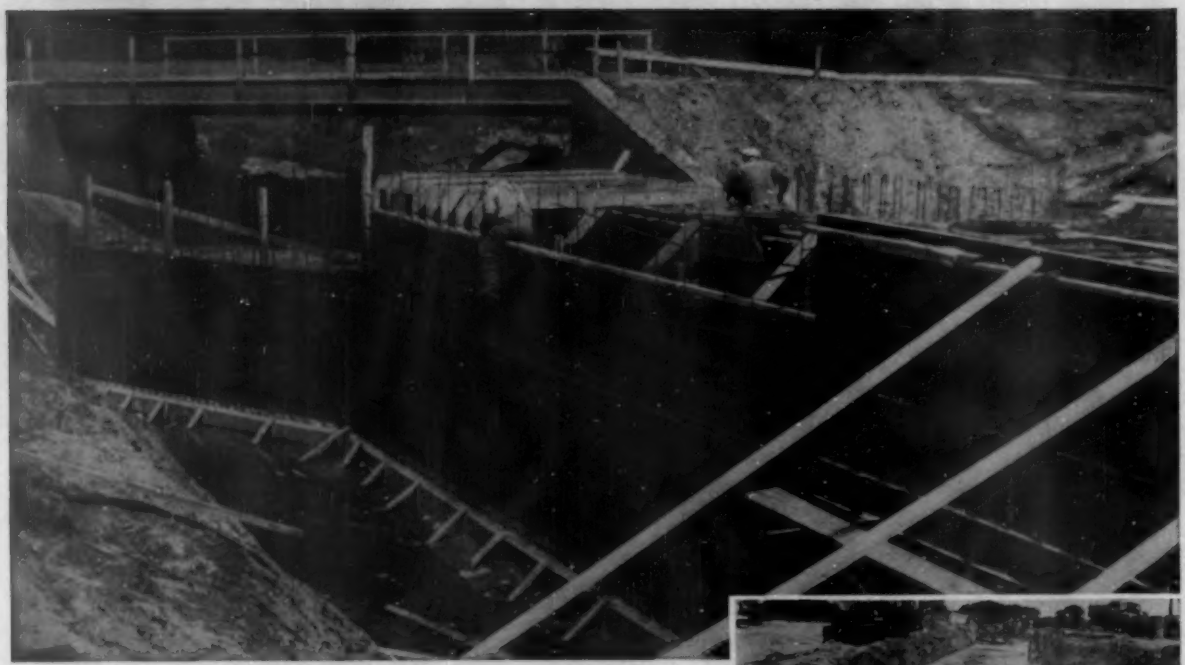
Michigan is a registered trade mark of

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2497 Pipestone Road
Benton Harbor 28, Michigan

It took four minutes to put 19 tons of material into this dump trailer. Six bucket loads filled it. Note that the 2¾-yd. Michigan has plenty of dumping clearance over the 10-ft. high side boards. Even with batch boards in place, the Michigan has no trouble.

. . . for more details circle 227, page 16



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Save LABOR, MATERIAL, TIME!

Simple mechanical assembly and pre-engineered techniques for handling virtually any forming condition make UNI-FORM Panels your best bet for fast, low cost forming. Successful contractors everywhere are using the UNI-FORM system to form bridges, overpasses, culverts, piers and abutments, because their experience has shown that UNI-FORM Panels give them the speed, flexibility and economy required to handle this complex type of forming at the lowest possible cost.

Let us prove our point. Send a set of plans for detailed forming specifications, recommendations and cost analysis. There's no obligation, of course.

P1901

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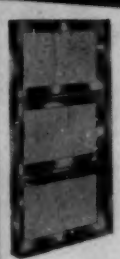
Here Are The Basic Elements:

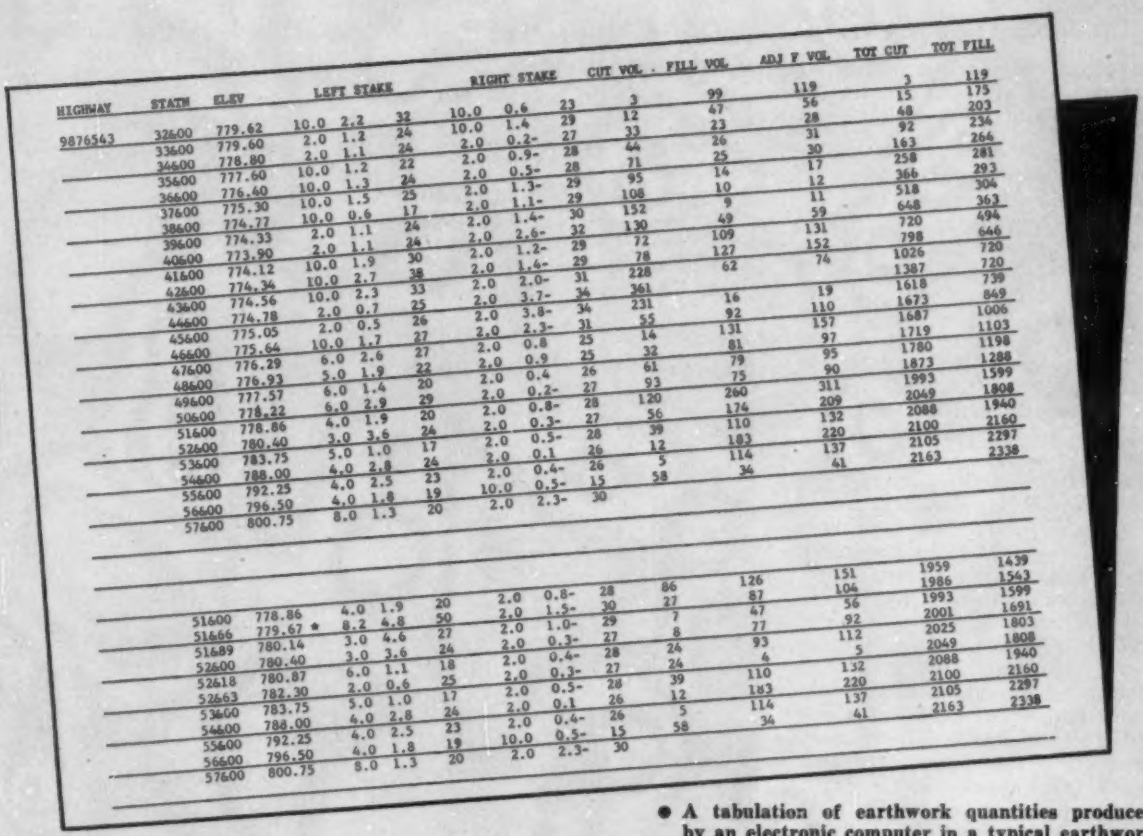


2. UNI-FORM Tie

3. UNI-FORM Tie Key

1. Steel framed, plywood faced UNI-FORM Panel

. . . for more details circle 313, page 16



HIGHWAY	STATN	ELEV	LEFT STAKE			RIGHT STAKE			CUT VOL.	FILL VOL.	ADJ F VOL.	TOT CUT	TOT FILL
9876543	32600	779.62	10.0	2.2	32	10.0	0.6	23	3	99	119	3	119
	33600	779.60	2.0	1.2	24	10.0	1.4	29	12	47	56	15	175
	34600	778.80	2.0	1.1	24	2.0	0.2-	27	33	23	28	48	203
	35600	777.60	10.0	1.2	22	2.0	0.9-	28	44	26	31	92	234
	36600	776.40	10.0	1.3	24	2.0	0.5-	28	71	25	30	163	264
	37600	775.30	10.0	1.5	25	2.0	1.3-	29	95	14	17	258	281
	38600	774.77	10.0	0.6	17	2.0	1.1-	29	108	10	12	366	293
	39600	774.33	2.0	1.1	24	2.0	1.4-	30	152	9	11	518	304
	40600	773.90	2.0	1.1	24	2.0	2.6-	32	130	49	59	648	363
	41600	774.12	10.0	1.9	30	2.0	1.2-	29	72	109	131	720	494
	42600	774.34	10.0	2.7	38	2.0	1.4-	29	78	127	152	798	646
	43600	774.56	10.0	2.3	33	2.0	2.0-	31	228	62	74	1026	720
	44600	774.78	2.0	0.7	25	2.0	3.7-	34	361			1387	720
	45600	775.05	2.0	0.5	26	2.0	3.8-	34	231	16	19	1618	739
	46600	775.64	10.0	1.7	27	2.0	2.3-	31	55	92	110	1673	849
	47600	776.29	6.0	2.6	27	2.0	0.8	25	14	131	157	1687	1006
	48600	776.93	5.0	1.9	22	2.0	0.9	25	32	81	97	1719	1103
	49600	777.57	6.0	1.4	20	2.0	0.4	26	61	79	95	1780	1198
	50600	778.22	6.0	2.9	29	2.0	0.2-	27	93	75	90	1873	1288
	51600	778.86	4.0	1.9	20	2.0	0.8-	28	120	260	311	1993	1599
	52600	780.40	3.0	3.6	24	2.0	0.3-	27	56	174	209	2049	1808
	53600	783.75	5.0	1.0	17	2.0	0.5-	28	39	110	132	2088	1940
	54600	788.00	4.0	2.8	24	2.0	0.1	26	12	183	220	2100	2160
	55600	792.25	4.0	2.5	23	2.0	0.4-	26	5	114	137	2105	2297
	56600	796.50	4.0	1.8	19	10.0	0.5-	15	58	34	41	2163	2338
	57600	800.75	8.0	1.3	20	2.0	2.3-	30					

	51600	778.86	4.0	1.9	20	2.0	0.8-	28	86	126	151	1959	1439
	51666	779.67 *	8.2	4.8	50	2.0	1.5-	30	27	87	104	1986	1563
	51689	780.14	3.0	4.6	27	2.0	1.0-	29	7	47	56	1993	1599
	52600	780.40	3.0	3.6	24	2.0	0.3-	27	8	77	92	2001	1691
	52618	780.87	6.0	1.1	18	2.0	0.4-	28	24	93	112	2025	1803
	52663	782.30	2.0	0.6	25	2.0	0.3-	27	4	4	5	2049	1808
	53600	783.75	5.0	1.0	17	2.0	0.5-	28	24	110	132	2088	1940
	54600	788.00	4.0	2.8	24	2.0	0.1	26	39	183	220	2100	2160
	55600	792.25	4.0	2.5	23	2.0	0.4-	26	12	114	137	2105	2297
	56600	796.50	4.0	1.8	19	10.0	0.5-	15	5	34	41	2163	2338
	57600	800.75	8.0	1.3	20	2.0	2.3-	30	58				

● **A tabulation of earthwork quantities produced by an electronic computer in a typical earthwork problem.**

ELECTRONIC COMPUTER

(Continued from page 99)

effectively in increasing his productivity.

At the present time electronic computers are being used for survey computations; for the computation of centerline grades; for earthwork computations both at the design stage and for final payment; for both geometric and structural design computations for bridges; for traffic studies including the development of trip desire charts, and the assignment of traffic to a proposed new route or system of routes; and for a number of less complex operations.

Over twenty states either are now using electronic computers on highway engineering work or are awaiting delivery of them. Others are considering installations. Some of the states, and the BPR are using computer facilities at service bureaus, universities or other agencies. In addition, a number of consultants either have computers or are using computer facilities commercially available. The computers being used in the states or on order, include the Bendix G-15, the IBM 604, the IBM 650 and the Univac 120. The Bendix computer uses punched paper tape; the others use punched cards. Other computers of comparable capabilities are available and may also enter the field.

SURVEY COMPUTATIONS

In the California division of highways, survey computations involving an average of over 2,000 courses per day are now being performed on the electronic computer, covering location, interchange and bridge design and layout, and right-of-way takings. The computations include the determination of unknown lengths and/or bearings, error of closure, traverse adjustments, coordinates, and areas for closed traverses, and are performed in a central computing unit which serves both the headquarters office and the eleven district offices. Survey data from district offices is processed and mailed back to the districts usually on the same day it is received. The time required for the computer method, including the preparation of input data, is about 20 percent of the time required using manual methods. The cost is about 40 percent of the cost by manual methods.

Similar programs have been developed and adopted by the Texas highway department and the Nebraska department of roads and irrigation.

The Bureau of Public Roads is in the process of developing a program for location traverses which will compute bearings and coordinate starting from any point of known coordinates, using measured course lengths and deflection angles.

The Oregon highway department is using electro-mechanical punched-card equipment for survey computations with plans for converting to an electronic computer in the near future.

GRADE COMPUTATIONS

In the Arizona highway department, the program developed for the computation of centerline

(Continued on page 111)

(Continued from page 97)

tractor in the year the decline occurs, and not averaged over the life of the machine.

● *"Metre" Method.* To determine the most economical time to replace equipment, find the total cost of major repairs and overhauls, productivity, availability, and capital decline for each year. Then average the costs of the first and second years to find the average cost per hour if traded at the end of two years. Do the same for the first three years, and so on until the lowest cost per hour is found. The number of years which will produce the lowest hourly cost would be the number of years the tractor can be economically run.

The charts will show how these rates are figured. In making these charts, Caterpillar used an average-sized machine, costing about $20,000, and assumed it would work 1800 hours each of the first three years, and 1500 hours each year thereafter. In this example, the lowest hourly rate occurred at the end of the third year. The 11 cents difference between the third and fourth years appears to be small, and many owners wonder why they should replace on such a small basis.

It must be understood that if the tractor was originally set up to operate for three years, the charge per hours for the fourth year would then be $4.25 per hour. The actual difference in dollars between the third and fourth year operation would be $759.00 (or 6900 hours at 11 cents per hour).

Correction

Two proofreading errors appeared in our January issue in the article "Wyoming's Rubber Asphalt Experiment—One Year Later," by F. B. Odasz and R. V. Witter of Husky Oil Company.

1. The sentence near the bottom of the first column, page 210, should have read, "It is advisable to supplement this macroscopic type of study with a broader microscopic study."

2. On page 221, the sentence in the second paragraph should have read, "On an area weighted basis the true improvement in chip retention after one year is 47%."

This latter correction is particularly important, since the figure 14% erroneously published gave a completely untrue picture of the results of this test. The editors regret these errors.

Rubber Belting Makes Good Pipe Lifting Sling

Here is a good example of a device not uncommonly seen but one that could be used oftener to good advantage.

It consists of a pipe lifting sling made by a piece of ½-inch thick reinforced rubber belting, such as is used on heavy duty conveyor work. The section of belt has been lapped over at the ends and riveted to form loops, and into these loops stout steel lifting hooks have been inserted.

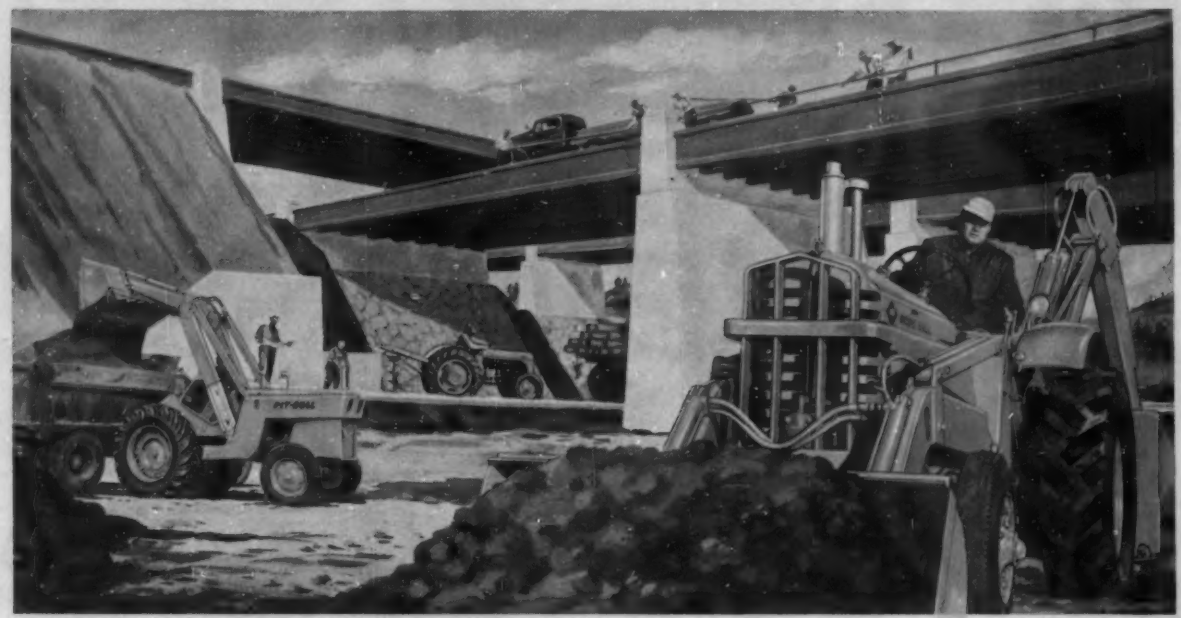
The lifting assembly is attached at the last minute by means of a clevis, and with only a moment's effort, the pipe is ready for lifting.

Seen on water line installation in a California city, Martin Bros., Inc., general contractors of Concord, California.

● Section of pipe being slung around for setting in trench on far side of crane.

● Close-up of lifting sling in position around a pipe ready for the hoist.

Choose from 5 low-cost tractors (34 to 52 hp)
...20 easily interchangeable, power-matched attachments



Typical Work Bull packages include: *42-hp Davis Pit Bull*, at left, uses ⅞-yd. bucket to clean up spill. *34-hp Work Bull Model 202*, center, uses auger to dig holes for retainer posts. *And 52-hp Work Bull 404*, at right, is equipped with ¼-yd. low, direct-thrust loader and a hydraulic backhoe which handles 12 to 36-in. buckets.

Versatile Work Bulls pay off

... as primary equipment

Work Bulls give both large and small contractors, municipalities and general industry a great new opportunity to put former hand labor, or work too small for their present equipment, on a paying power basis. With five tractors (34 to 52 hp) — each with a score of *switch-in-a-smoke-break* attachments — Work Bulls are truly a dozen machines in one. They pay off on small, scattered work-and-run assignments. And they'll earn their keep off-season, too. You can use them or lease them out for snow removal, or scores of money-making jobs.

... as backup machines

Ever worked a job too big for one machine but too small to be profitable with two? That's another type of assignment where Work Bulls pay off. Team Work Bulls with bigger, more expensive, single-purpose rigs. You get the exact power-equipment cost ratio the job demands. And you increase equipment scheduling efficiency. What's more, Work Bulls travel anywhere without expensive trailers or special travel permits. Thus, it's highly practical to shoot them from site to site as your production picture changes.

... as utility or cleanup tools

When you're using shovels to clean up spill in the loading area, scrapers to smooth out haulroads, crawler dozers to haul wagons or skid light and medium-weight machinery — there's a profitable place for Work Bulls on your job. Low in initial price, hourly cost and upkeep—Work Bulls provide a perfect means of making cleanup and utility jobs pay. With Work Bulls on the job, your mainline equipment can concentrate on the type of work it's designed for. Work Bulls supplement "big stuff"... easily, inexpensively.

Write today for 24-page catalog and name of your distributor

M·H·F WORK BULLS

Division of Massey-Harris-Ferguson, Inc.

19-C Quality Avenue **Racine, Wisconsin**

... for more details circle 278, page 16

Announcing! NEW HIGHER G.V.W.'s, AIR BRAKES, NEW BIGGER TIRE SIZES IN

For bigger loads, bigger profits, new G.V.W. ratings of Chevrolet medium-duty models go all the way up to 21,000 lbs. . . . and new G.V.W. ratings of heavy-duty models weigh in at a 36,000-lb. maximum! Here, too, are new chassis components to help you haul king-sized payloads!

G.V.W.'s INCREASED AS MUCH AS 4000 POUNDS! Chevrolet's mighty Series 10000 Triple-Torque Tandem is more than ever the industry's load-hauling champ—with G.V.W. hiked from a high 32,000 lbs. to a whopping 36,000 lbs.! In Series 5000H and 6000H models, G.V.W.'s have been advanced 1500 lbs. (to 21,000 lbs.) and in Series 7000 and 8000 models G.V.W.'s are now up 1000 lbs. (to 22,000 lbs.)!

NEW CAST-SPOKE WHEELS are now available* on Chevrolet Series 9000 and 10000 trucks equipped with HD 18,000-lb. rear axle and full-air brakes. These payload boosters are strong, yet light, widely interchangeable and easy to service.

NEW FULL-AIR BRAKES. Safe straight-line stops with the heaviest loads are assured by these rugged new brakes*, provided on Series 9000-10000 models equipped with HD 18,000-lb. rear axle and cast-spoke wheels.

TASK·FORCE 57 CHEVROLET TRUCKS

NEW CAST-SPOKE WHEELS, NEW FULL-1957 CHEVROLET TASK·FORCE TRUCKS!

NEW BIGGER TIRES. New 11-22.5 tubeless tires*, front and rear, or 10.00-20 tubed tires*, are added assurance that 1957 Series 9000 and 10000 Chevrolet trucks are built from the ground up to haul your biggest load with ease!

These are the newest reasons why a Chevy's your best bet if your hauling job is *big!* For all the facts about sky-high payloads and profits, see your nearby Chevrolet dealer. . . . Chevrolet Division of General Motors, Detroit 2, Mich.

**Optional, extra cost.*

NEW CHEVY L.C.F. MODELS ARE SPECIALLY DESIGNED FOR MAXIMUM LOADS, EASY MANEUVERING AND SERVICING.

1. *Compact length* of the L.C.F. tractor (89¼ inches)† enables you to pull a long 35-foot trailer while holding overall truck length to less than 45 feet.
2. *Low height* of L.C.F. cab means the distance from ground to cab floor is shorter; entering or leaving is more convenient.
3. *Short wheelbase* makes Chevy L.C.F.'s *maneuverable* trucks easy to wheel in and out of tight spots.
4. *Good weight distribution*—more truck weight on the front axle —means that extra load weight can be placed on the rear axle.
5. *Easy servicing* is an added L.C.F. advantage; all engine components are quickly accessible.

†Front of bumper to back of cab.

PROVED ON THE ALCAN HIGHWAY... CHAMPS OF EVERY WEIGHT CLASS! CHEVROLET

. . . for more details circle 243, page 16

Galion Iron Celebrates Half Century of Machinery Making

The revolution in roadbuilding was in its infancy when, in 1907, The Galion Iron Works & Mfg. Company was organized at Galion, Ohio, by D. C. Boyd. The firm has prospered and maintained a close association with the road construction industry through the years.

Today the Galion firm is celebrating its 50th anniversary, having become one of the largest equipment producers in the highway field with its road rollers and motor graders manufactured in five plants in the United States and in foreign countries.

Old-timers, as well as younger men in the road business, would have enjoyed visiting Galion's 4-day "open house" held recently at the factory. Visitors on this occasion were given a tour through the engineering department and factory, to see the workings of a company devoted entirely to designing, engineering and building of a complete line of road rollers and motor graders. The Galion name today stands for 23 models or weights of rollers from 3 to 20 tons and 8 models or sizes of graders from 50 to 190 H.P. The pride of its line is the recently introduced Grade-O-Matic grader and the Roll-O-Matic roller lines. The Model T-700 grader on display is a 190 H.P. giant, weighing more than 20 tons and said to be the world's largest and most productive motor grader.

In preparation for stepping up production of the big 14-20 ton 3-axle tandem roller, the firm recently doubled its manufacturing capacity at its Bucyrus plant.

Galion's 289 distributors were well represented at this Golden Anniversary celebration, having gathered at Galion from throughout the world on their way to the Road Show in Chicago.

1909. The first Galion motor grader, a light farm-type tractor attached with small horse-drawn motor grader.

1925. Galion rear-controlled motor grader with steel crawler drive.

Today. World's largest motor grader. Galion T-700 Grade-O-Matic with torque converter, power shift transmission and other features. Weight 40,000 lb.

EIMCO 105 PRODUCTIVE VERSATILITY IN ACTION!

NEW! FRONT END LOADER

Here's the latest addition to the 105 wide-range family of rugged earth-moving tools.

In loading applications where physical and haulage conditions make its use more practical . . . here is a front end loading mechanism that gives you extra strength for the most severe job.

Large, double-acting hydraulic boom cylinders provide ample power to hoist loads weighing up to 15,000 lbs. to full height. Boom and bucket controls may be operated simultaneously.

To fill the big (2½ yard) bucket, this loader develops 25,000 lbs. digging force at the lip. 40,000 lb. pry-out force and 40 degree bucket tip-back at ground level gets full bucket loads, minimizes spillage. It carries loads close and low for maximum stability.

It operates in 9' 6" headroom . . . discharges into haulage units up to 14'.

Exclusive features of the hydraulic system provide an extra margin of protection against mechanical delays.

Bulldozer

Dozer blade attachments are designed to make full use of the extra-production features of the 105. In broad usages such as cutting haul roads for logging outfits . . . pioneering in shale and hard rock . . . clearing fire paths for the Forest Service . . . the Eimco 105 Bulldozer has proven its high-capacity ability the world over.

All attachments are Eimco-built to standard SAE mounting dimensions for the basic 105 Tractor. This means extra performance from every attachment through independent track maneuverability . . . up front visibility . . . power shift operating ease . . . balanced design for maximum stability . . . quality built for dependable on-the-job service.

Excavating Loader

Where digging is extra tough . . . and haulage provisions can be adopted to take full advantage of overhead discharge — the time-proven 105 Excavating-Loader will give you **bonus** loading power at the bucket lip and **bonus** dumping speed to accelerate the entire cycle.

Unique contour of the rugged rocker arms . . . bucket design and smooth, steady flow of engine power transmitted to the bucket lip through the torque converter gets 39,200 lbs. of digging force right where you want it . . . in the pile. Awkward maneuvering to get into dumping position is eliminated in ideal overhead discharge applications.

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B-339

. . . for more details circle 334, page 16

Your Wickwire Rope Distributor and our sales engineer ... a helpful team

This sales engineer—an expert on the selection, installation and maintenance of our products—is with your Wickwire Rope Distributor every time he makes a call.

True, sometimes he's hundreds of miles away, working in the field or at the mill. Yet, even if he's not there in person, your Wickwire Distributor has the full assurance that sales engineers such as this one are *always* quickly available to help you.

It's just one more reason why your Wickwire Distributor knows he's got top-quality wire rope, slings and strand to sell ... and that these products will serve you well.

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A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

. . . for more details circle 231, page 16

ELECTRONIC COMPUTERS

(Continued from page 103)

grades, previously mentioned, is being used in day-to-day operations. The grades are computed in a continuous process through vertical curves and station equations. The time required for the computer method, including the preparation of input data, is about 25 percent of that using manual methods.

The Louisiana and Ohio highway departments have completed similar programs, and the Illinois division of highways has included grade computation in its program for the computation of earthwork quantities.

The Texas highway department is investigating the feasibility of developing a program for determining the most economical grade line for a given profile and given basic design criteria.

EARTHWORK COMPUTATIONS

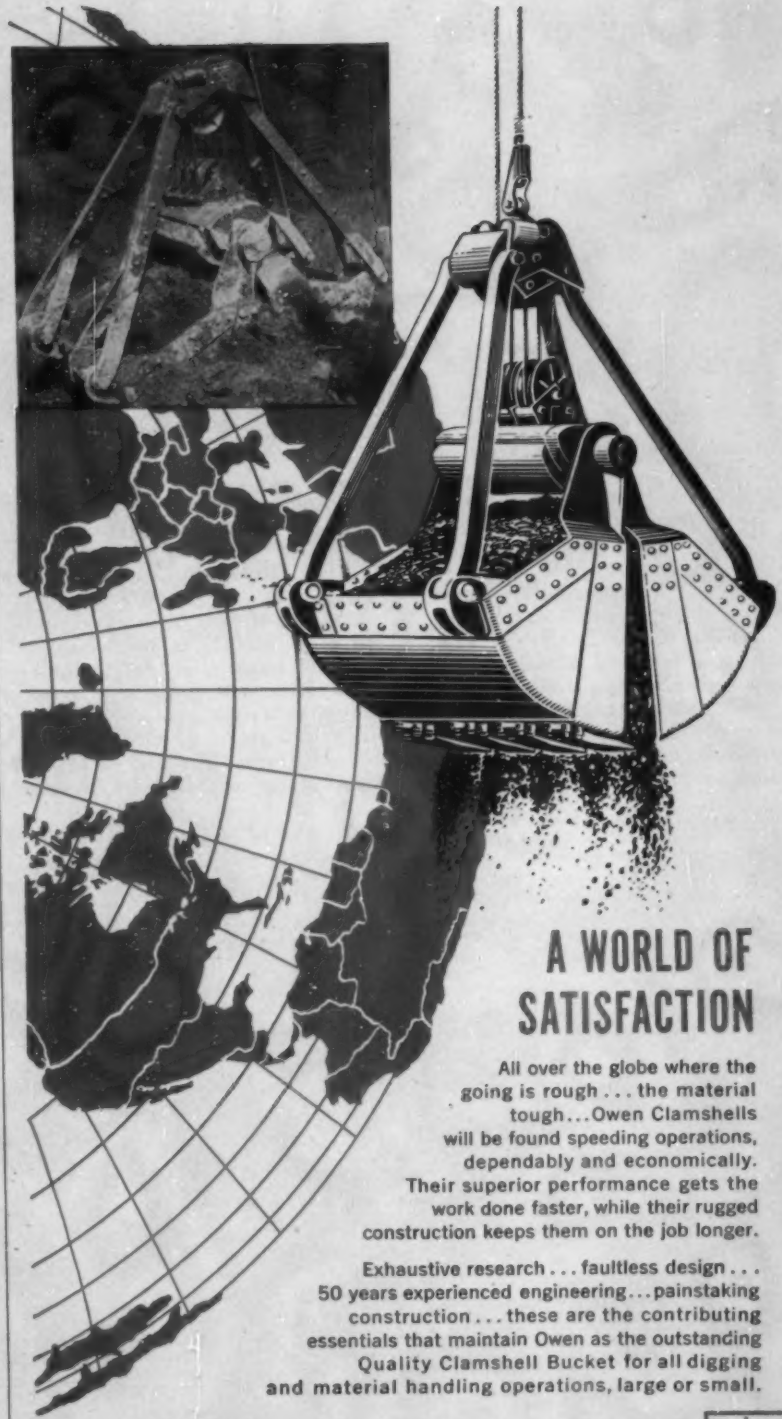
Earthwork quantities are presently being computed on electronic computers in Arizona, California, Texas, Washington and the Bureau, both for use in the design stage and for final payment. The time required for the computer methods, including the preparation of input data, ranges from 5 to 10 percent of the time required using manual methods. Data on relative costs are being developed; however, rough estimates indicate that the cost by computer methods is from 20 to 25 percent of the cost by manual methods.

For earthwork quantities at the design stage, the input includes the cross section data, centerline grades, and design template data with provision for superelevation, curve widening and varying side slopes. The computer produces a tabulation of the cut and fill volumes at each station and the difference between them adjusted for shrinkage or swell, the cumulative volumes of cut and of fill, mass diagram ordinates, slope stake coordinates.

For the computation of earthwork quantities from staked cross sections, the procedure is similar except that slope stake data are not included in the computer output. When final sections are used, the computer input consists of the original and the final cross section data.

Other states, including Illinois, Louisiana, Massachusetts, Michi-

(Continued on page 112)



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. . . for more details circle 286, page 16

ELECTRONIC COMPUTERS

(Continued from page 111)

gan, Missouri, Nebraska, New Mexico, New York and Ohio, are in the process of developing computer programs for earthwork computation.

In Oregon and Montana, electromechanical punched-card equipment is being used for the computation of final payment earthwork quantities. Conversion to electronic computers is expected to be made in the near future.

STRUCTURAL DESIGN

Outstanding in the area of structural design, is the work being done by the American Bridge Division of the United States Steel Corporation. This firm is using an electronic computer as standard procedure in computing dimensions, stresses and deflections for various types of structures. The structures involved include continuous girder bridges with up to five spans, arches, rigid frames, cantilever and suspension bridges, and various types of trusses up to eighty panels in length. It is reported that the use of the electronic computer saves about 75 percent of the cost of equivalent calculations performed manually, with an even greater saving in designers' time. In one instance, a set of twenty equations with twenty unknowns, involving wind stresses in a suspension bridge, was solved on the electronic computer in about ten minutes.

The Georgia highway department has completed and tested a computer program for geometric computations for multi-span skewed bridges on curved alignment, on either a grade or vertical curve, and with bents either parallel or not parallel. The beams are placed on chords of concentric arcs. The computer produces chord distances between intersections of the concentric arcs with bent cap center lines, distances between the concentric arcs measured along the center line of each bent cap, center line grade elevations, rate of slope for each beam, and middle ordinates of the concentric arcs at the midpoint of each span. Programs are in process of development for the structural analysis of rigid frame bents subjected to varying dead, live and wind loads, and of continuous reinforced concrete spans with variable moment of inertia. Georgia is also developing a program for the design of composite single spans.

In the Arizona highway department, a program for the computation of dead load deflections for continuous beam bridges has been completed and a program for the design of retaining walls and bridge abutments is being developed.

In California a program for curved multi-span bridges similar to the one developed in Georgia has been completed. Program have also been completed for the design of composite beams, and for the computation and tabulation of bridge reinforcement steel quantities. In addition, California is in the process of developing a program for the analysis of rectangular columns subjected to biaxial bending.

In the Washington department, a program is being developed for the analysis of five-span continuous reinforced beam bridges, which can also be used for lesser numbers of spans.

(Continued on page 114)

4 YARDS PER TRIP is the usual load for this SCOOPMOBILE Model LD-8A, even when digging in soil. Notice how bucket tips up *completely*, the excellent visibility and safety for operator. SCOOPMOBILE LD-8A has power shift, air brakes, power steering, planetary drive and torque converter. Capacity (struck) is 3 cu. yards. It will pay you big dividends to investigate today.

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. . . for more details circle 280, page 16

5 products at a time...
crushed, screened and washed

300 tons per hour...
with 35% crush

Minimum labor required...
all-electric operation

. . . that's why Genesee Sand & Gravel Company SELECTED ALL CEDARAPIDS EQUIPMENT

When a producer opens up a new pit, his prime concern is to get into big-volume production fast, with mininum labor . . . that's why he's mighty glad to have a high-capacity, easily set up plant like this portable Cedarapids Commander—Wash-All combination. 3000 tons a day of five sizes of accurately graded gravel and sand *is profitable operation!*

For Genesee Sand & Gravel Company's new plant, President Henry Jaeger, Jr. selected a Cedarapids Commander, a Wash-All plant, 5 portable stockpiling conveyors, and a 540-ft. sectional feed conveyor fed by a Cedarapids reciprocating feeder and hopper. The plant is completely electrified and equipped throughout with Cedarapids Motorized Head Pulleys to reduce labor and maintenance requirements.

Genesee moved into the new pit near Genesee Depot, Wisconsin, on October 2. By October 15 they were in production and are now turning out . . .

Mason sand	8 mesh and under	5%
Coarse sand	¼" to 8 mesh	50%
Pea gravel	⅜" to ¼"	2%
No. 1	¾" to ⅜"	22%
No. 2	1½" to ¾"	21%

Whether you're an experienced, well-established producer like Genesee Sand & Gravel Co., or just entering the field, you can depend on Cedarapids equipment for the high capacity, low maintenance performance that spells profitable operation in your specific job. Ask your Cedarapids dealer about Cedarapids equipment for your job.

Cedarapids Commander—The completely electric Commander crushing and screening plant in Genesee Sand & Gravel Company's new pit is equipped with spray bars on the screen and a sand screw attachment which delivers mason sand to the sand classifier. All other crushed and screened material discharges into the Wash-All Plant.

Cedarapids Wash-All—Coarse sand and three sizes of gravel are screened and washed in the Cedarapids all-electric Wash-All. The coarse sand is taken out by the twin-screw washer-classifier-dehydrator, while each size of crushed gravel is stockpiled with a portable conveyor. Note Motorized Head Pulleys on all conveyors in the entire plant.

Cedarapids — Built by IOWA

IOWA
MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

. . . for more details circle 254, page 16

● Another unit being used by highway departments, the Bendix G-15 electronic computer.

(Continued from page 112)

The Bureau has nearly completed a program for the analysis of continuous steel beam bridges of three to five equal or unequal spans.

In the area of photogrammetry, the California division of highways is in the process of developing a program for checking aerial contour maps using Church's four-point analytical method. When completed and tested, if found satisfactory, this program should eliminate a great deal of field checking.

In the Ohio highway department, a method and a program are being developed for the computation of earthwork quantities using cross-section data taken direct from aerial photographs in a Kelsh Plotter. Preliminary estimates for evaluating alternate alignments, as well as more precise estimates for plan quantities, are covered. For the latter, an auxiliary device is used with the plotter to measure horizontal distances with the same degree of precision possible in the measurement of vertical distances. The three coordinates of each point on the cross section are automatically punched into cards for use as electronic computer input.

A second device is used by which these punched cards, together with design data cards, are used to direct the movement of a point of light on an oscilloscope thus delineating

(Continued on page 116)

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You get top abrasion resistance and easy welding with low-cost Colmonoy No. 2 hard-facing electrodes. Use them on tractor treads, dipper teeth, ditcher teeth, truck beds, dragline buckets, any steel or manganese steel part.

Excellent arc stability and good flowing qualities make these low hydrogen AC-DC electrodes a cinch to apply. A Colmonoy No. 2 deposit has a Rockwell C hardness of 50 to 60.

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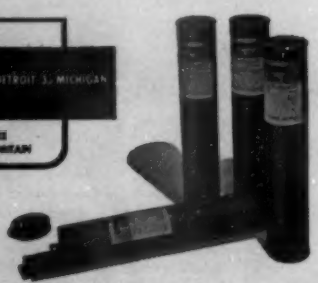
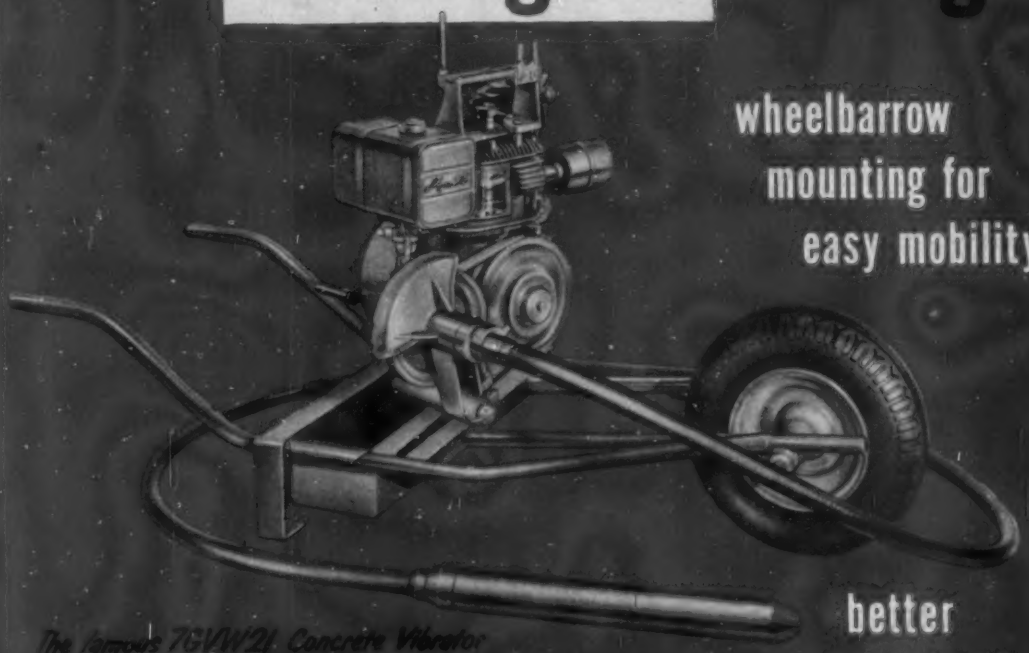
Available in 1/8, 5/32, 3/16, and 1/4-inch diameters, packed in 10-lb. sealed metal containers.



. . . for more details circle 316, page 16

now, in concrete vibrators, too,

if it's Remington, it's right!



wheelbarrow mounting for easy mobility!

better concrete at lower cost!

The famous 7GVW21 Concrete Vibrator has 4 great features that make it right for you!

- Dependably powered by rugged single-cylinder, 4-cycle air-cooled gasoline engine with countershaft drive and automatic clutch.
- This versatile unit can also be used to power attachments for concrete surfacing, sanding, wire brushing, pumping and other jobs.
- Long-reaching flexible shaft made up of 7 ft. or 14 ft. sections. Extra sections can be added as needed.
- Unit can be moved right along with the work on pneumatic-tired wheelbarrow mounting. This unit is also available on 360° swivel round base mounting.

MODEL 7GVW21 *5 HP concrete vibrator. Available with 2⅜" x 20" 7,000 RPM vibrating head or 2⅛" x 12" 10,000 RPM vibrating head.*

You'll use less cement, coarser aggregate and produce denser, more uniform concrete...and do it in fewer man-hours!

That's a mighty big order to be sure! But it's being done every day on every kind of concrete job by these indispensable vibrators by Remington—the newest name in power tools and famous for 141 years for quality in sporting firearms and ammunition.

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. . . for more details circle 269, page 16

ELECTRONIC COMPUTERS

(Continued from page 114)

the cross section and the design template at each station. By using an open shutter microfilm camera, the cross section with the template superimposed on it, is recorded on microfilm for use by the designer.

Based on the designer's analysis, the design data cards are revised and used with the cross section cards as computer input data for the earthwork computation. New microfilm recordings are made and occasional sections are enlarged, reproduced, and made a part of the contract plans. In addition, the tabulation of earthwork quantities produced by the computer, and an automatic plotting of the mass diagram, are reproduced photographically and included in the contract plans.

For several years, punched-cards processing and tabulating equipment has been used in the analysis of the large masses of data involved in highway planning studies. The electronic computer provides a means of further facilitating and greatly expediting the handling of these data and of increasing the quality of route planning through more thorough analyses than are feasible with conventional punched-card equipment. In a number of states, procedures and programs are being developed for converting parts of these studies to analysis on electronic computers.

Electronic computers are already being used in urban studies in the analysis of origin-and-destination survey data including development of trip desire charts, prediction of future traffic distribution, assignment of traffic to a proposed new route or system of routes, and in computation of benefit-cost ratios.

In the Detroit metropolitan area transportation study, using an IBM 604 electronic calculating punch, a total of 23,500 zone-to-zone movements were assigned to a network of expressways and connecting arterials totaling 370 miles in length in less than three weeks including all coding, card punching, processing and tabulating of assigned volumes.

UNIVAC IN WASHINGTON

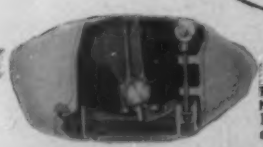
In the Washington, D. C. metropolitan study, a Univac is being used to project 1948 origin and destination survey data to 1955, to compare the results with data obtained in a second O-D survey made in 1955-56, to prepare projections of urban travel for the years 1965 and 1980, and to apply the projected traffic distribution to the planning of an adequate highway and mass transportation system.

In the Chicago area transportation study, a Datotron electronic computer is being used. Considerable experimental work is being done there in developing new and improved methods using an electronic computer. In one method being developed, each trip is traced in succession on a cathode ray tube and recorded on photographic film, thus automatically producing trip desire densities. The cathode ray tube-computer combination is also being used in fitting regression curves to points projected on the face of the tube. In the assignment of traffic by the computer, a "feedback" device is being used to provide automatically for the effects of overloads.

Basic experimental work is being

(Continued on page 118)

EXCLUSIVE TAPERED ROLLER BEARINGS AT BOTH ENDS OF DROP-FORGED CRANKSHAFT . . . Main bearing failure just doesn't happen.

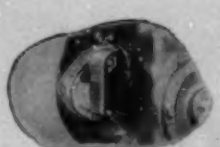


POSITIVE OIL PUMP LUBRICATION SYSTEMS NEED LESS WATCHING . . . Provide surest lubrication . . . even when oil is at a very low point.

WISCONSIN ENGINE-POWERED EQUIPMENT

When a mower is built to last . . . *meant to last* . . . it does better work with less effort, saving you on-the-job manhours. And since the mower is rugged throughout, your operator spends less time in servicing. These are well-known facts. And you'll note that manufacturers who are building equipment with quality in mind are specifying Wisconsin Heavy-Duty Air-Cooled Engines for power in increasing numbers . . . rugged, dependable, built to last, *meant to last.*

Write for handy service map S196 pinpointing our service organization.



EXCLUSIVE MAGNETO MOUNTS OUTSIDE WHERE SERVICING IS EASY . . . Incorporates an impulse coupling that delivers faster all-weather starts.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

2,000 SERVICE STATIONS . . . SEVERAL NEAR YOU

A7-4069-½1

. . . for more details circle 319, page 16

Electric steer, and big low-pressure tires, let the "D" self-load quickly and safely in narrow lanes between grade or form stakes. Between small-yardage assignments such as this, "D" can deliver profitable yardage working with your big-production fleets.

for big jobs . . .

little jobs . . .

scattered jobs . . .

clean-up jobs . . .

finishing jobs . . .

When Winkelman-Tompkins-Jones, of Plattsburg, New York (working on a joint venture contract) built runways for the Plattsburg Air Force Base in New York State, blow-sand left imperfections in the grade between forms. One D Tournapull was sent in to repair the damage before final paving was begun. The "D" quickly removed the blow-sand and leveled the grade where it was uneven. One man, and one machine, did this quickly, sparing work crews for other duties.

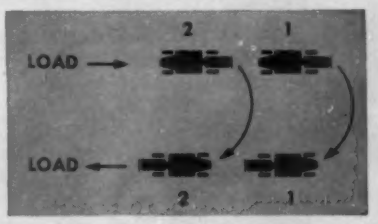
On hundreds of other earthmoving operations, the 7½-yard "handyman" D Tournapull has handled a wide variety of job assignments. It hauls fill, levels sub-grades, slopes shoulders, cuts drainage ditches, fills washouts, levels land for building sites, handles clean-up on construction projects . . . all at low cost with only a one-man crew.

Works alone, or in fleets

This rubber-tired hauler fills the need for a fast, flexible self-propelled scraper to handle both large and small yardage assignments . . . on long and short hauls.

With its 7½-cubic yard heaped capacity, D Tournapull is large enough and fast enough for profitable use in pusher fleets . . . yet small enough for economical one-man operation where self-loading is a desirable advantage. It works easily in tight quarters and around obstructions, making 180° turns in 26', two feet less than its overall length. With "D's" electric controls, machine easily regulates depth of cut or spread to accurately satisfy specifications.

Used in pairs, D Tournapulls help push-load one another . . . eliminate need for tractor or grader pushers. For example, scraper #2 first loads scraper #1 . . . then #1 turns, assists #2



Travels job-to-job fast

Not only is the "D" highly versatile, it *runs* from one worksite to the next . . . over highways or cross-country, over curbs and railroad tracks, at speeds to 29.5 mph.

You don't need a truck-and-trailer to haul D Tournapull to its assignments. You eliminate all loading and unloading delays. And on production earthmoving, the "D" works fast . . . moves more earth in less time than big crawler-tractor-scraper combinations costing thousands of dollars more.

Ask for owner-verified reports of actual performance records. Tournapull's advantages can help you. Contact your LeTourneau-Westinghouse Distributor for information. He is always at your service.

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LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

. . . for more details circle 264, page 16

WHERE QUALITY IS A HABIT

ELECTRONIC COMPUTERS

(Continued from page 116)

done on the use of electronic computers in simulating traffic flow, principally at the Institute of Transportation and Traffic of the University of California, at the University of Michigan, and at Brown University.

In the Bureau of Public Roads, an IBM 705 electronic computer is being used to compare various methods of predicting future traffic distribution to determine which method is the most satisfactory and also to determine the number of iterations required for reasonable accuracy. Origin-and-destination surveys made in 1948 and in 1955 are being used in developing the comparisons. With a total of about 30,000 zone-to-zone movements using 6 modes of travel, this study could not be attempted by manual methods.

In a nation-wide traffic study being undertaken in the Bureau, origin-and-destination surveys from a number of metropolitan areas are being used to obtain trip desire data for county-to-county movement somewhat comparable to zone-to-zone movement in a metropolitan area study. This is a multiple-correlation problem involving population, distance between areas, automobile registrations, income, recreational facilities and other factors which could not possibly be undertaken without the help of an electronic computer.

HYDROLOGY, HYDRAULICS

The use of electronic computers in the solution of hydrologic and hydraulic problems involved in highway engineering is being explored in the BPR. One type problem being investigated involves multiple correlation of hydrologic data in estimating peak rates of runoff for selected frequencies from watersheds in the same physiographic area for use in the hydraulic design of highway structures.

A second type of problem adaptable to solution on electronic computers involves the determination of backwater produced by a given bridge taking into account stream contraction, type of abutment, effect of piers, eccentricity of the bridge with respect to the flood plain, and skew. This problem occurs in determining the waterway opening required for floods of various frequence within a given limiting amount of backwater. It can also be applied to the determination of the most economical hydraulic design for a given site taking into consideration first cost, costs arising from flood damage including scour, flooding of adjacent lands and effects on approaches, and disruption of traffic.

● **The IBM 650 computer of the type which is helping highway engineers to revolutionize procedures in many areas of highway work.**

OTHER APPLICATIONS

In the Texas highway department, a program has been developed and adopted for extending, analyzing and tabulating bid data at contract lettings. A similar procedure in the Washington department is being converted from electromechanical equipment to the electronic computer.

In the Arizona department, a program for sieve analysis of soils has been developed.

In the Bureau, programs have been developed and adopted for computing the acreage of clearing and grubbing, and for the computation of borrow pit excavation.

A program for computing borrow pit excavation has also been developed at the Massachusetts Institute of Technology for the Massachusetts department of public works.

Electronic computers will be used on the new AASHO road test to process and analyze the tremendous mass of data developed during the course of the test. With the millions of pieces of data involved, it is estimated that it would take 10 to 15 years after completion of the test to analyze the data and prepare the final report if the electronic data processing equipment were not used. In this application, data from electronic detecting devices will be recorded in a form which can be used as direct computer input, or in some cases in a form which can be electronically converted to an acceptable input form, in order to further expedite the processing of the test data.

These are applications of the electronic computer to highway engineering either in use or in process of development. Some of the other areas which suggest themselves as possibilities for electronic computation include sufficiency ratings, accident analyses, parking studies, and various problems susceptible to analysis by statistical methods.

From the applications cited, it is evident that rapid progress is being made. It is also evident that the electronic computer is a valuable device for research and exploration as well as for day-to-day operations.

TRAINING PERSONNEL

The field is too new and is developing too rapidly for well defined patterns in organization and personnel to have become established.

With respect to organization, however, the present tendency is to use a single integrated data processing and computing unit located in the highway department headquarters office. This kind of organizational arrangement is most flexible and permits processing of both engineering and fiscal work, if desired.

With respect to personnel, minimum requirements include an operator for the computer and operators for auxiliary equipment, together with directing personnel. A maintenance technician is not essential since service can be obtained for a monthly charge. If the machine is installed on a rental

basis, which is the usual arrangement, service is furnished by the manufacturer.

Responsibility for over-all operation, including the development of applications to engineering problems, should be assigned to an experienced engineer, trained in the use of the computer including programming and this is the usual practice. In addition, it is usual practice to train a selected group of engineers, who are specialists in location, design, structures, planning and other technical areas, in computer programming to enable them to assist in the development of programs in their specialized fields as part of their assigned duties.

A number of states have found it advantageous to employ a mathematician, or to assign a statistician already on the staff, to assist the computer development engineer. A person trained in either of these disciplines can be of considerable help in analyzing problems, in formulating solutions and in developing both the procedural and coded programs in the most efficient form.

With a number of states working on the development of computer applications to highway engineering operations, there is need for correlation to minimize duplication and otherwise to gain maximum advantage from the efforts expended. The Bureau is developing a plan for the collection and distribution of information on program development and allied subjects on a continuing basis. Plans are also under way for the development of a library of programs so that those developed in one state can be made available to others.

> In an engineering problem, the engineer's knowledge, accumulated through years of study and experience, is embodied in the program. Once the program is completed and released, this knowledge is thereafter applied automatically, thus relieving the engineer of repetitive analysis and routine computation. In this way, the engineer and the computer form a team in which the capabilities of each are used to best advantage.

THE FUTURE?

While the general tendency has been to follow established conventional procedures, the work in Ohio and in Chicago are impressive examples of what can be done with the computer in developing entirely new methods. As further progress is made, it seems logical to expect further departures from existing methods leading to more exhaustive analyses and more refined design.

In Canada, a program has been developed for the structural design of a beam bridge deck which takes into account the interaction of forces on longitudial and transverse members through the use of matrices derived from correlated deflection equations for all members of the deck acting as a grid. While this kind of analysis would be prohibitive in cost and time if done manually, it is reported to be entirely practicable using an electronic computer. A similar method of analysis is being used in England in the structural analysis of rigid building frames on electronic computers.

With respect to computer capabilities it seems obvious that there will be continued improvement. Memory capacity is being enlarged, storage access time is being reduced, input and output speeds are being increased, character reading devices are being perfected, and other improvements are in the making. In addition, there is a definite trend toward transistorization which will result in reduced space, weight and power requirements. With respect to programming, more and more library routines will of course be developed, and it is quite possible that coding ultimately will become entirely a computer function.

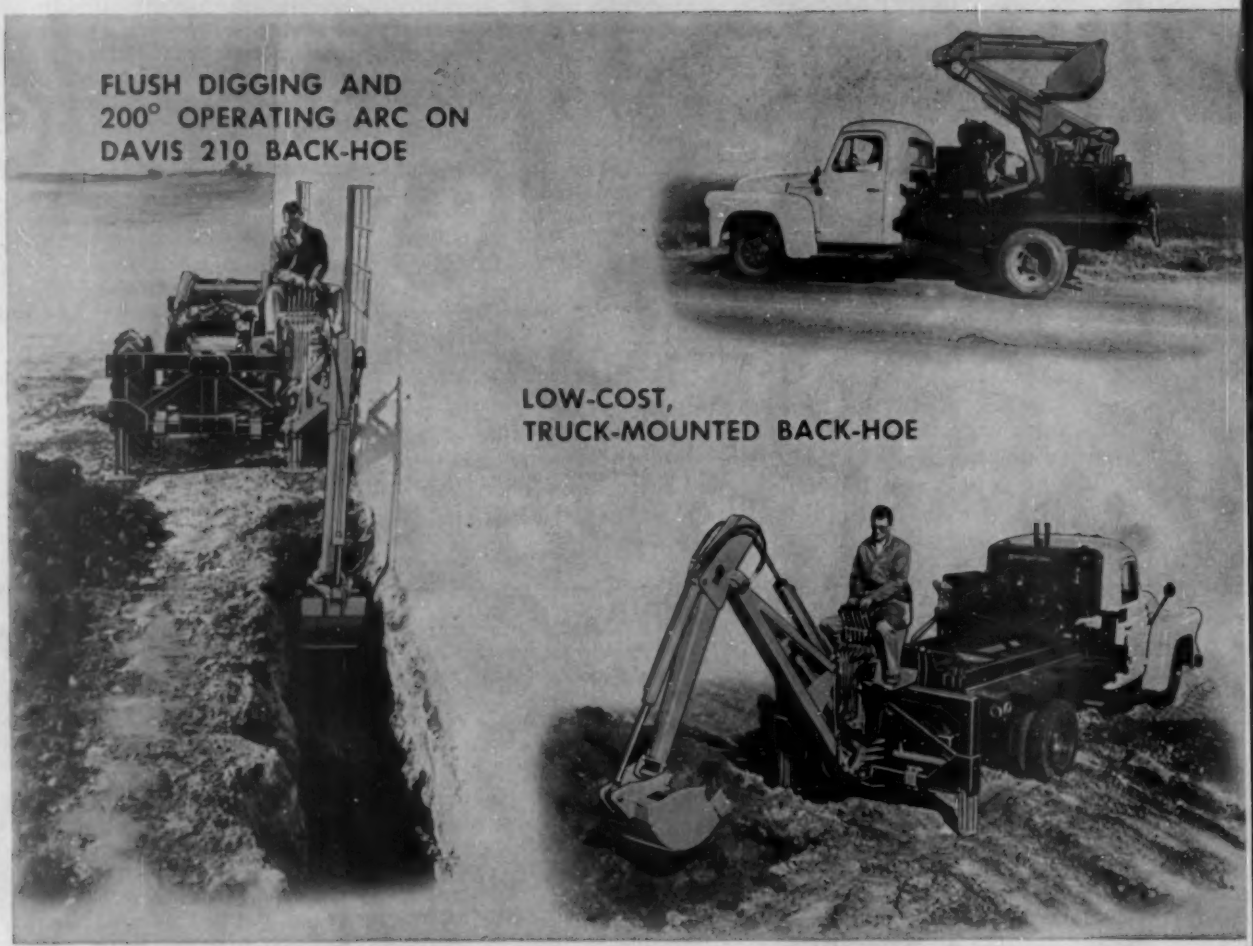
The progress made thus far in applying electronic computers to highway engineering work is indicative of possible future progress. Each successful development leads to another, and computer possibilities would seem to be limited only by our vision and our ingenuity in adapting them to our needs.

Vacuum-Powered Foot Valve Operates Sprinkler

A simple arrangement for opening and closing the foot valve on a water truck was devised by Trinity Construction Company, of Houston, Texas. It consists of a quick-acting diaphragm-operated valve, placed in the usual location for turning the water on or off. The diaphragm is then connected through a three-way valve and into the intake manifold of the truck engine. A spring holds the valve closed at all times unless the vacuum is turned on by the operator, sucking the valve open.

When the operator desires to close the valve, he releases the vacuum and at the same time turns air into the vacuum chamber so that the spring will close the valve.

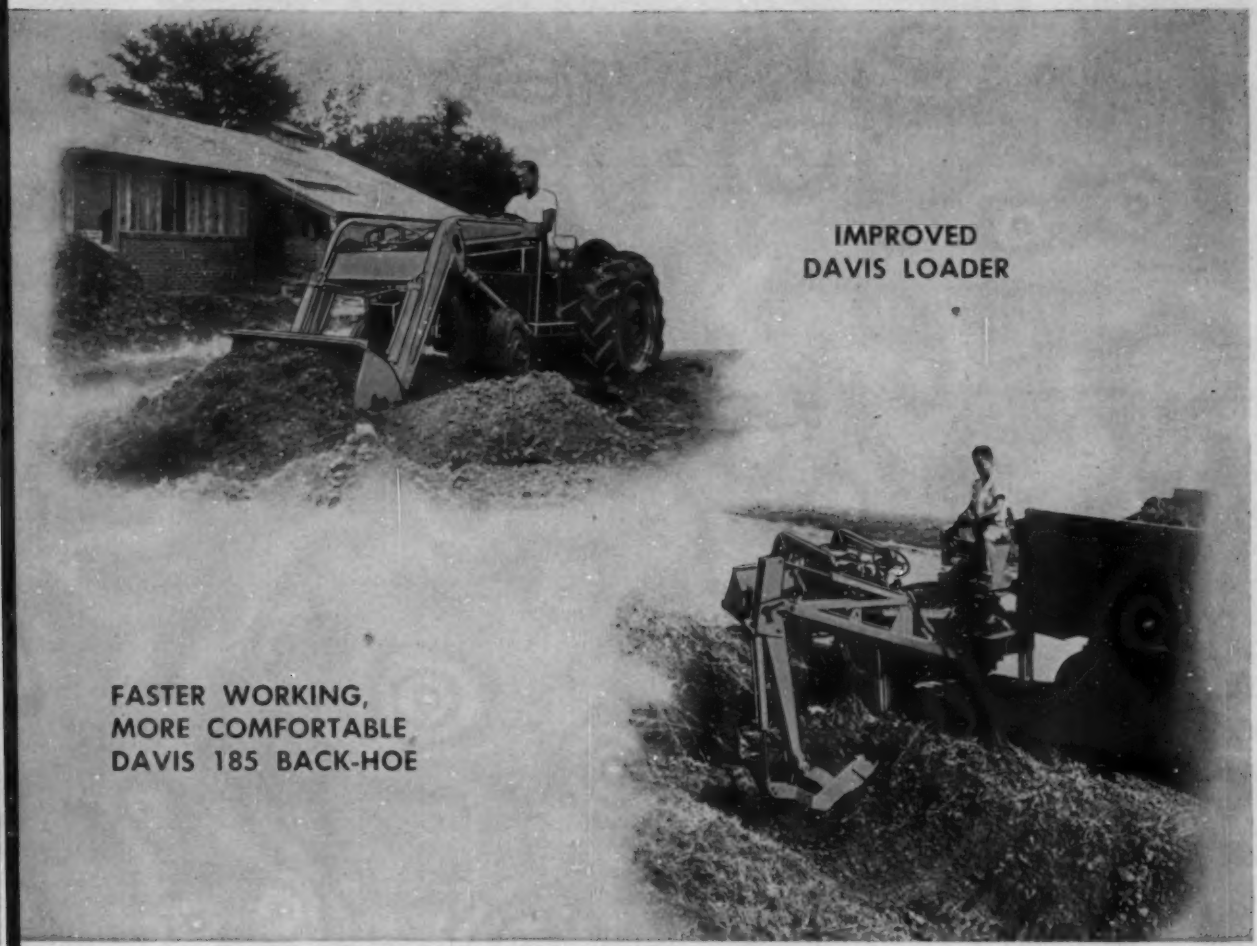
● Truck valve hook-up was installed on this sprinkler truck.



DISCOVER

DAVIS

THE EQUIPMENT THAT LEADS THE WAY



New Back-Hoes and Loaders for 1957

...make More Profits for You!

Here's good news for back-hoe and loader users. Davis opens a whole new era of profits. ***The New 210 Davis Back-hoe*** has three interchangeable mounting points so you can switch digging positions from center to side for flush digging alongside buildings, fences, etc.... and an engineering achievement desired by all — but accomplished only by Davis — an exclusive ***hydraulic rotary boom swing cylinder*** that gives smooth, continuous ***200° cushioned operating arc*** without ever changing a pin. Both the new 210 and the popular 185 have 7,000 pounds of breakaway power and an adjustable seat with extended foot rests.

Both models are now available as low-cost, ***truck-mounted units*** for any one-ton or larger flat-bed truck — self-powered, completely detachable, or attached in matter of minutes, and designed to fold into a compact package for easy transporting with everything being accomplished hydraulically. ***The Davis Loader***, already the possessor of more "firsts" than any other make, has also been improved for even better workability. For better profits in 1957... for better equipment in earth moving and material handling, see **DAVIS**, America's premium equipment that sells for competitive prices.

Available for Most Popular Tractors

Davis Products are sold and serviced anywhere in the United States.

For name of dealer call Western Union by number and ask for Operator 25 . . . or write . . .

MID-WESTERN INDUSTRIES, INC.
1009 S. WEST ST. DEPT. R, WICHITA, KANSAS

. . . for more details circle 279, page 16

New Equipment Seen At The Road Show

(Continued from page 91)

Shifting is easier, with no clashing of gears, through use of hydraulic clutches and constantly-in-mesh gears. Drive fluid in the torque converter absorbs shocks normally passed on to the engine and other drive components.

Torque converter allows use of exact power to fit load demand.

Principal factor in the full power shift transmission is the single stage converter-coupling. It automatically multiplies the engine force up to 3½ times to provide high torque needed for starting. When equipment is up to speed, it acts as a fluid coupling between engine and drive shaft.

For more information circle 122 on Service Coupon Page 16 and mail now.

4-Speed Crawler Tractor

A new crawler tractor with 4-speed transmission and variety of front and rear attachments was shown by Oliver Corp., 400 W. Madison St., Chicago 6, Ill. The 4-cyl. engine has a bore and stroke of 3¼ by 4 in. 1700 rpm at governed speed. Weight of the unit with standard 10-in. width track shoes is 4255 lb. Special equipment includes a power pulley and power take-off. Attachments include scraper, dozer, jet-trencher and loader.

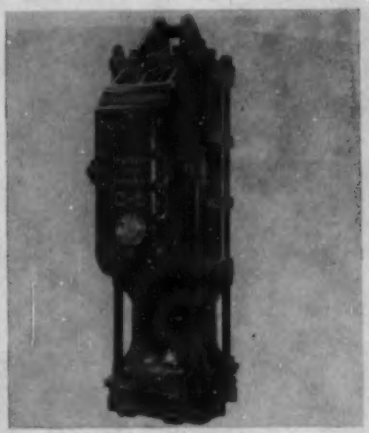
Oliver Crawler Tractor

For more information circle 123 on Service Coupon Page 16 and mail now.

Steam-Air Pile Hammer

A new compound steam-air pile hammer exhibited by McKiernan-Terry Corp., Pile Hammer division, Dover, N. J., is said to cut almost in half the amount of motive power needed for hammer operation. The model C-5 has a low total weight to ram weight ratio, delivers 110 blows per minute with a striking energy of 16,000 ft.-lb. yet has low striking velocity, thus causing, it is claimed, less pile head deformation.

The hammer is designed to protect itself against damage if the pile slips away, permits operation without recourse to throttle valve should the hammer be entirely unsupported by the pile. Hammer is self-stopping



McKiernan-Terry Hammer

when no support exists under the anvil block, automatically returns to operation when support is re-established.

For more information circle 124 on Service Coupon Page 16 and mail now.

20 TPH Asphalt Plant

A new asphalt plant which is said to produce 20 tons per hour of hot mix was introduced by White Manufacturing Co., Elkhart, Ind. The model L-10, portable or stationary, has pitched blades, delivers thorough kneading action. Dry, pre-graded aggregate is measured in 1000-lb. hopper. Asphalt bucket is filled to graduated, pre-determined level and then tipped into full length of mixer. Because aggregate is heated separately in rotating drum dryer and bitumen is also heated separately before materials are mixed, any type of bituminous mix can be produced: hot mix, emulsified, cutback, or cold mix.

One man can operate the L-10 with a second generally used to operate a loader to keep the aggregate hopper filled. For capacity production, an auxiliary source of warm asphalt is required.

For more information circle 125 on Service Coupon Page 16 and mail now.

Rubber Tire Loader

A new rubber tire front-end loader, the Tractoloader, model TL-20D, displayed by Tractomotive Corp., Deerfield, Ill., features an Allis-Chalmers diesel engine, planetary axles, rear axle disconnect, power steering and a tip-back bucket. The loader has a 2-yd. bucket capacity, a lifting capacity of 6750 lb. at 3.5 mph, 13,500 lb. at 0.0 mph.

The TL-20D has a single stage hydraulic torque converter and a power shift transmission. It has a forward road speed of up to 22.6 mph. Overall length of the machine with bucket on ground is 18 ft. 2¾ in. Height to top of steering wheel is 7 ft. 3½ in.

Standard equipment includes heavy duty drawbar, four-wheel power booster hydraulic brakes, rear axle disconnect, four-way adjustable seat.

Tractoloader TL-20D

For more information circle 126 on Service Coupon Page 16 and mail now.

V-12 Turbocharged Diesel

A new V-12 turbocharged diesel power unit, shown by Waukesha Motor Co., Waukesha, Wis., is a 12-cyl., 60-degree vee model called the VLRDBSU.

(Continued on page 125)

White Asphalt Plant

Salt stabilization builds better roads

Stabilizing with *Morton* Salt means added road life and reduced maintenance costs.

Stabilizing a road with Morton Salt is often the difference between a good road that will stand up under heavy traffic and a road that will require excessive maintenance within a year.

Secondary roads. Regardless of the materials used, roads stabilized with Morton Salt give more service per dollar than roads built by any other method—and the savings in aggregate alone more than pay for the salt. You get smooth, durable, water-repellent surfaces that require minimum maintenance.

Primary roads. Stabilizing the base course with Morton Salt helps prevent the 9 out of 10 road failures which result from faulty foundations.

Shoulders. Stabilizing shoulders with Morton Salt not only checks erosion and rutting, it reduces dust and eliminates accidents caused by soft shoulders . . . also saves on grass and weed removal.

. . . for more details circle 281, page 16

☐ *Please send me your free booklet on salt stabilized roads.*

☐ *I also would like free technical assistance from a Morton Road Building Engineer.*

Name_____
(Please print)

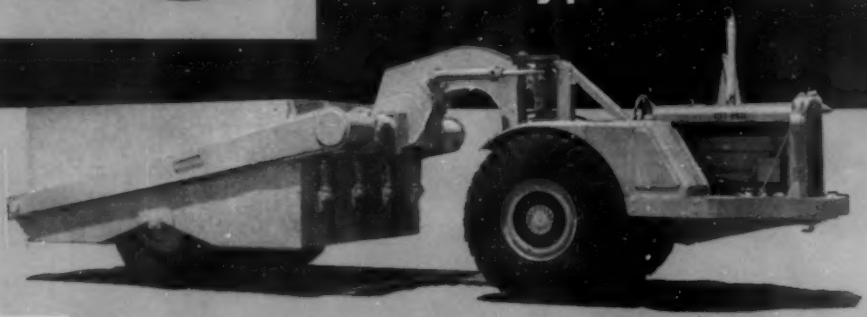
Title_____

Address_____

City_____ County_____ State_____

MORTON SALT COMPANY
INDUSTRIAL DIVISION
Dept. RS-3, 120 So. LaSalle Street, Chicago 3, Illinois

BIG Southwest Compaction Equipment for all types of tractors



BIG Southwest Compaction Rollers

BIGNESS MEANS SPEED when earthmoving and compaction is the problem. These big, multiple-box rollers are made in five sizes ranging in weight capacity from 10 to 100 tons. **Single Box Compaction Rollers** are also available in two sizes with weight capacities up to 100 tons.

BIG Sheepsfoot Rollers

RANGING FROM 5 TO 20 TONS in weight capacity, there are six models of Southwest Rollers featuring full oscillating double drums and two-piece feet with replaceable tips.

BIG Southwest Rippers

IT'S A GIANT that weighs 25,000 lbs. Is built to penetrate to depths of 36", 42" or 48". Special center standard can be furnished to go 60" deep.

BIG Southwest Sprinkler Tanks

5000 TO 7500 GALLONS is the capacity of these big semi-trailer type Sprinkler Tanks. Have front, rear and under-tank spray bars. Get the facts about these big units; write for bulletins today!

Southwest Welding & MANUFACTURING CO.
CONSTRUCTION MACHINERY DIVISION
ALHAMBRA, CALIFORNIA

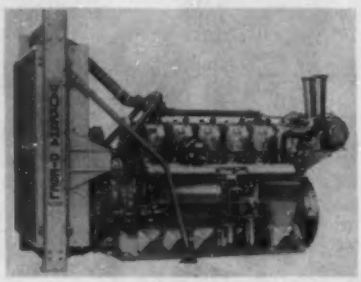
. . . for more details circle 301, page 16

New Equipment At The Road Show

(Continued from page 122)

The unit is the even firing, four-cycle, solid injection, overhead valve compression ignition type, has an 8½-in. bore and stroke and 5788 cu. in. displacement. Connecting rod arrangement is the side-by-side type with opposing pistons operating from a single wide-area crankpin.

The unit develops approximately 1100 hp at 1200 rpm. Major parts are interchangeable between right and left cylinder banks. Main and rod bearings are easily accessible. Extra equipment installed when specified includes power take-off-, telegraph throttle control, vacuum compensating or Woodward close regulating governors.



Waukesha V-12 Diesel

For more information circle 127 on Service Coupon Page 16 and mail now.

Self-Widening Finisher

An all-hydraulic, self-widening finisher with diagonal rear screed swing, introduced by Jaeger Machine Co., Columbus 16, O., features direct hydraulic control of traction, self-widening, screed oscillation, screed lift and lower, and diagonal rear screed swing. Tamper attachment and transportation wheels are also hydraulically operated.

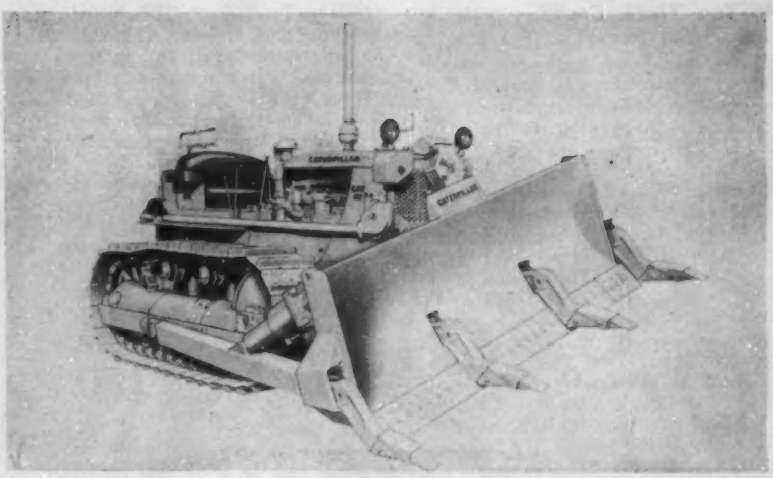
The JX has 6 ft. of infinite width adjustability in each size, or 6 ft. of mechanical adjustability in 6 in. increments. It offers quick-crown-change screeds or conventional type, vibratory "bullnose" screed, pan or tube attachments, and traction wheels for every condition. It has four forward and four reverse speeds.

For more information circle 128 on Service Coupon Page 16 and mail now.

"New Concept" Bulldozer Design

A new concept in bulldozer design was introduced by Caterpillar Tractor Co., Peoria, Ill.

Designated the "Gyro Dozer", this new earthmoving tool combines the functions of ripping and moving material in one bulldozing operation, and eliminates the need for a separate ripping operation. Working in hard to handle material, it is claimed to produce full blade-loads in less time and shorter distances.



Gyro Dozer

Essentially, the new bulldozer is stated to provide greater dozing efficiency by restricting the length of cutting edge entering the ground, breaking up and conditioning hard material more readily, and supplying a more efficient wedging angle to utilize the full power of the tractor.

Key factors in the higher production of the Gyro Dozer are four penetrating teeth mounted on the cutting edge of the bulldozer blade. These teeth extend forward 20 in. in front of the cutting edge, and are used in ripping up stubborn material in order to more rapidly obtain full loading of the blade.

For more information circle 129 on Service Coupon Page 16 and mail now.

Light Weight Pump

A new pump, the Series 80, exhibited by Gorman-Rupp Co., Mansfield, O., features improvements which have eliminated the check valve and added straight-in suction, with the pumped liquid entering directly at the eye of the impeller. Exhibit included pumps ranging from 1½ in. to 8 in. in size, all available with base or wheel mounts.

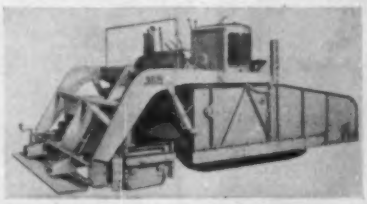
Gorman-Rupp Pump

The pump has a diaphragm drive rod cushioned on downstroke, claimed to increase diaphragm life ten times. Other features include suction accumulator for smooth pumping flow, antifriction helical ground gears and bearings operating in oil, and lightness, with the 3-in. diaphragm pump weighing 130 lb. The 4-in. pump offers 145 gpm pumping at five feet static life, weighs 355 lb.

For more information circle 130 on Service Coupon Page 16 and mail now.

Paver-Type Aggregate Spreader

A new aggregate spreader was shown by Jaeger Machine Co., Columbus 16, Ohio. The paver-type unit, the SPS-6, lays all base and surface aggregates and plant-mixed stabilized soils. It lays up to 16-in. thickness in 9 ft. 6-in. widths without block-offs. It does 19 ft. 6-in. to 32-ft. base or surface courses in two passes.



Jaeger Aggregate Spreader

The hopper is equipped with two independent dual material conveyors and independent hydraulic gates. It has oscillating screeds, adjustable for crown, with accurate leveling insured by combination of 7 ft. 6-in. equalizing crawlers and leveling pans.

The spreader is designed in two basic units, a tractor-hopper-conveyor unit and a screed assembly. The tractor unit contains a power deck with gasoline engine, transmission, clutches, drives and all operator controls.

For more information circle 131 on Service Coupon Page 16 and mail now.

45-Ton Truck Crane and 2-Yd. Shovel

A 45-ton capacity truck crane was displayed by Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.

Called the model 445, the new unit has a total weight of 88,310 lb. width of 9 ft. 4 in. at the crane cab. Its length with 4-ft. boom to front is 55 ft. 9 in. The truck has a Waukesha engine with 214 horsepower at 2400 rpm.

For special high light crane service, the unit has straight boom jibs in lengths of 15, 20 and 30 ft. Maximum allowable main boom is 120 ft. Maximum jib boom allowable on maximum boom is 30 ft.

The Koehring Co. also announced a new 2-yd. shovel. The model 805 has a 25-ft. boom with 18-ft. 6-in. sticks. Its length with standard crawlers is 14-ft. 8-in. Width with standard crawlers, 24-in. wide shoes, it 10-ft. 8-in.

Maximum dumping height with pitch of boom at 45 degrees is 20-ft. 5-in. Digging radius at maximum reach at 45 degrees is 35-ft. 6-in.

For more information circle 132 on Service Coupon Page 16 and mail now.

High Speed Tractor-Logger

A new line of four Michigan tractor loggers designed for heavy duty off-the-road service was presented by Construction Machinery division of Clark Equipment Co., Benton Harbor, Mich. The model 75, 110 hp engine, has a capacity of 12,000 lb., weighs 13,000 lb. The 175, handling logs up to six feet in diameter, has a 135 hp engine, capacity of 20,000 lb., weight 34,000 lb.

The model 375 can take logs eight feet in diameter and weighing 20 tons. It is powered by a 210 hp engine, with capacity of 40,000 lb. and weight of 70,000 lb. The model 210 logging arch has a 25-ton capacity with 210 hp engine and weight of 40,000 lb.

For more information circle 133 on Service Coupon Page 16 and mail now.

Crushing and Screening Plants

Models of two new portable crushing and screening plants were exhibited by Pioneer Engineering division of Poor & Co., Inc., Minneapolis 14, Minn. Both the 44 and 45 series feature full screen length sand removal. Feeding to the third deck allows both a full deck screen for immediate separation of pit material. Utilization of the top deck for screening of crushed material eliminates necessity of separating pit run and crusher run material.

The new models scalp off material that can be handled readily by the roll crusher and by-pass it around the jaw. Quick adjustment of the jaw from the operator's platform to meet variations in pit conditions allows both crushers to operate at peak efficiency without need of changing screens.

For more information circle 134 on Service Coupon Page 16 and mail now.

Variable Weight Rollers

A new line of tandem rollers embracing four sizes ranging from 1½ to 4 tons was shown by C. H. & E. Manufacturing Co., 3849 N. Palmer St., Milwaukee, Wis. Features pointed out for the four rollers in the line include enclosed transmission, multiple disc clutches, single lever control, automotive steering, internal expanding brakes, big roller construction.

C. H. & E. Tandem Roller

The 91A, 1½ to 2 tons, has guide rolls measuring 24 in. in diameter by 30 in., drive roll 30 by 36 in. Enclosed transmission is self-contained unit with metal disc clutches running in oil. Model 92A, 2 to 2½ tons is identical to 91A except for additional weight. The 3BT, 2½ to 3½ tons, has big rolls but relatively light weight for finishing work and for applications where wide rolling surface is important. This machine is the same as the 3BA in size and features except for latter's greater weight, 3 to 4 tons.

For more information circle 135 on Service Coupon Page 16 and mail now.

New Controls, Mounting and Cab For Crane-Shovel

A crane-shovel exhibited by Thew Shovel Co., Lorain, O. featured improvements in controls, in turntable mounting and in cab design. Only two "Joy-Stick" hand levers are used to apply metered air to all turntable friction clutches. Air is fed to clutches at desired rate of flow while allowing, according to the manufacturer, full normal "feel" of all operations.

Thew Crane-Shovel

The turntable revolves on a circle of 70 hardened steel balls. The outer race is attached to the crawler, the inner to the turntable. The balls themselves interlock the two races and hold turntable to crawler. They take all loads and thrusts, thus ruling out need for center pin and nut and centering gudgeon or turntable rollers and exposed roller path.

For more information circle 136 on Service Coupon Page 16 and mail now.

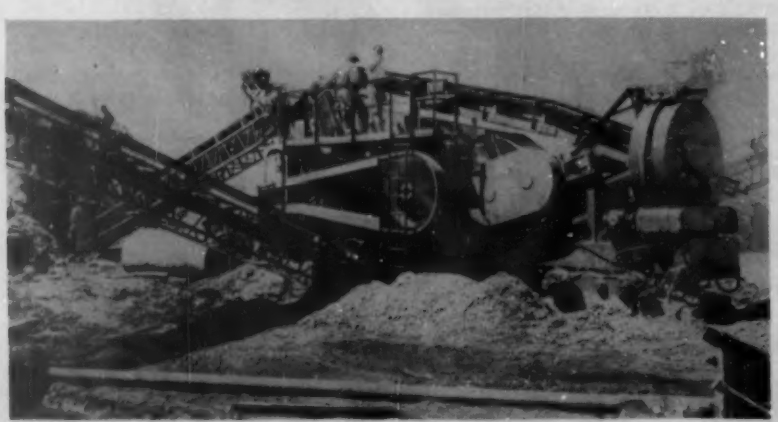
Rubber Tire Tractor Dozers

Two new Michigan rubber tire tractor dozers with turbocharged diesel engines were displayed by Construction Machinery division of Clark Equipment Co., Benton Harbor, Mich. The model 280 has a blade width of 11 ft. 9 in., 210 hp engine, and weight of 42,000 lbs. The 380 has a blade width of 13 ft. 3 in., 375 hp engine, weight of 62,000 lbs.

The new tractor dozers have wide-base tubeless tires for high flotation and maximum traction. Hydraulic controls provide positive down-pressure for heavy dozing and the blade can be tilted by a double-acting tilt cylinder to pry loose rocks or stumps. Rear wheel power steering permits turns while dozing, with no loss of power or load. Each unit carries a swinging drawbar for easy connection of scrapers, sheepsfoot rollers or similar equipment.

For more information circle 137 on Service Coupon Page 16 and mail now.

(Continued on page 131)



Pioneer Crushing Plant

Galion Allsteel Model 19TTE Excavator trailer dump with 45 ton Model 88381 Duo-scopic Hoist.

1,920 cubic yards a day on a 15 mile haul

Galion Allsteel Model 19TTE Excavator trailer dumps are outstanding performers in the excavating equipment fleet of Greco Contractors, Chicago, Illinois.

Greco operates 8 of these units on the Congress Street Expressway job in Chicago. Loaded by shovel or dragline, each of these trailer dumps handles up to 30 cubic yards of material and makes 7 to 8 fifteen mile round trips to the dump each shift, through heavy traffic.

Built to haul large quantities of excavated material over the highway to distant disposal points, Excavator trailers are engineered to provide even weight distribution on trailer and tractor axles. And, they are constructed to withstand the damaging effects of shovel loading.

An order for 3 additional Model 19TTE's has just been placed by Greco Contractors. Describing the Congress Street job, Mr. P. J. Greco says: "We are hauling a mixture of rock, broken concrete and a very sticky mud. The combination of 6-inch radius floor corners, tapered body, barn door type tailgate and good dump angle gets rid of the material with no difficulty. Stability in dump position is remarkable. We also like the way the load is distributed on the trailer and tractor axles."

Find out how Galion Excavator trailer dumps can meet your heavy material hauling requirements. Your nearby Galion Allsteel distributor will recommend the model exactly suited to your job. Call him today! AA-1280

. . . for more details circle 339, page 16

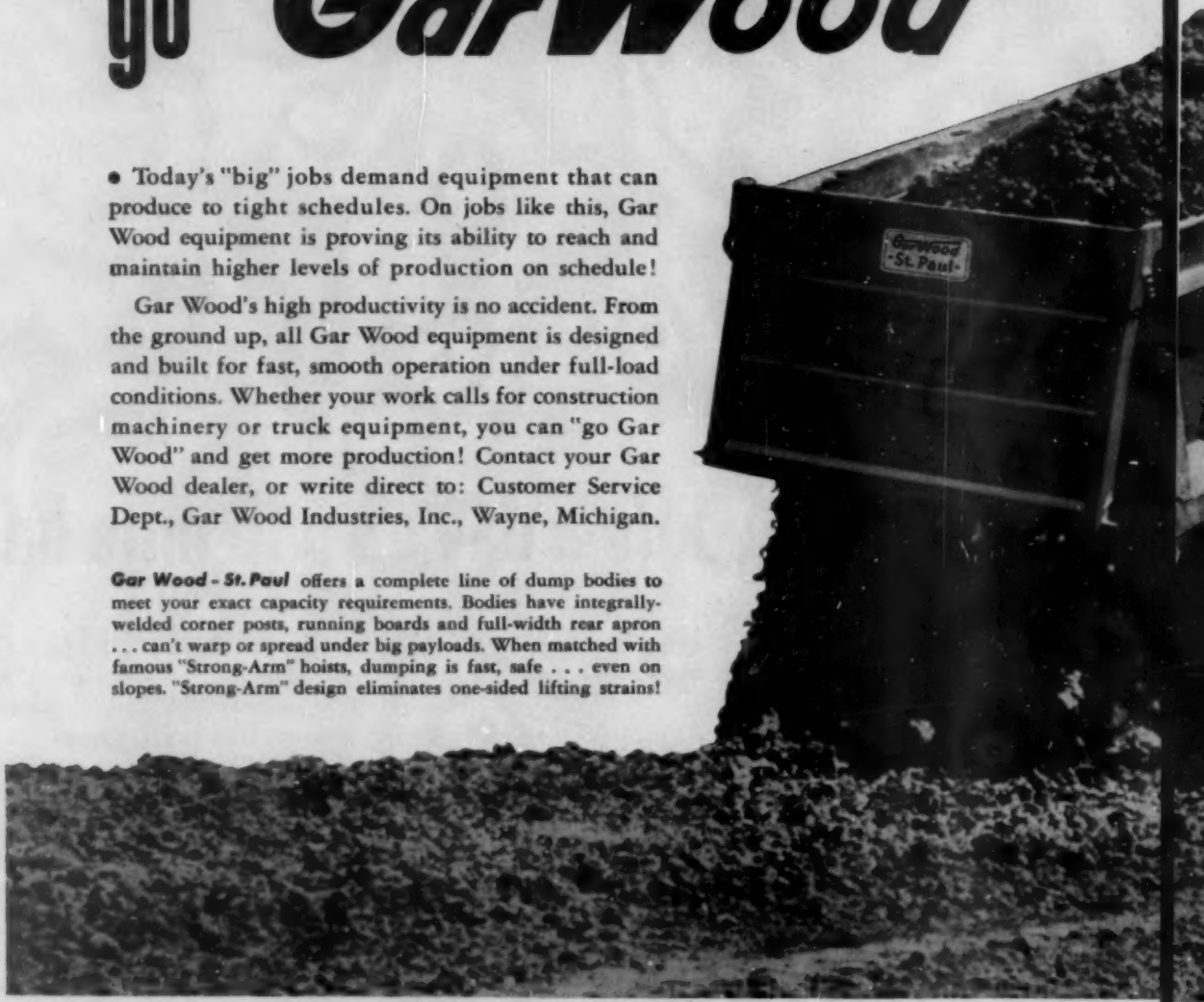
THE DUO-SCOPIC GALION ALLSTEEL BODY COMPANY • GALION, OHIO

For the production you need

go GarWood

• Today's "big" jobs demand equipment that can produce to tight schedules. On jobs like this, Gar Wood equipment is proving its ability to reach and maintain higher levels of production on schedule!

Gar Wood's high productivity is no accident. From the ground up, all Gar Wood equipment is designed and built for fast, smooth operation under full-load conditions. Whether your work calls for construction machinery or truck equipment, you can "go Gar Wood" and get more production! Contact your Gar Wood dealer, or write direct to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.



Gar Wood - St. Paul offers a complete line of dump bodies to meet your exact capacity requirements. Bodies have integrally-welded corner posts, running boards and full-width rear apron . . . can't warp or spread under big payloads. When matched with famous "Strong-Arm" hoists, dumping is fast, safe . . . even on slopes. "Strong-Arm" design eliminates one-sided lifting strains!

GAR WOOD INDUSTRIES,

PLANTS IN WAYNE AND YPSILANTI, MICH.; FINDLAY, OHIO;

on today's big jobs

Gar Wood-Buckeye ditchers are real production machines. Efficient transmission of power insures maximum power at the digging wheel. And, this power is easier to control in a Buckeye! Hydraulic wheel hoist and hydraulic conveyor drive are instantly operated from seat by simple, one-hand controls. No complicated shifting, no need to stop digging wheel or crawlers.

Gar Wood ¾-yard excavators pay off in many "high-output" features. Positive, independent chain crowd on the 75B puts full engine power into every bite. Independent travel means operator can hoist or swing while moving. Dependable production is insured by heavy-duty conical-hook double rollers and flame-hardened gears and shafts.

Gar Wood-Buckeye Hi-Way Wideners dig clean, flat-bottomed ditch. Excellent uniformity of width and depth of cut eliminates later finegrading. Fast, accurate control makes it easy to hold desired grade. Conveyor discharges spoil to either side, clear of widened ditch. Owners report digging up to a mile of clean side ditch per day!

INC. Wayne, Michigan

MATTOON, Ill.; RICHMOND, CALIF.

. . . for more details circle 242, page 16

Maginniss motor-in-head concrete vibrators—best for every job!

Use the right tool...

Skilled mechanics are careful to use the tool best suited for the job at hand. Profit-conscious contractors, too, use equal care when selecting concrete vibrating equipment.

And, because Maginniss builds both Hi-lectric induction motor-in-head vibrators for heavy work and Uni-lectric series motor-in-head vibrators for light work, you can choose the vibrating tool best suited for your construction jobs—large or small!

For better concrete . . . higher production . . . lower costs, see your Maginniss distributor. He'll recommend the Maginniss motor-in-head vibrator exactly right for your needs.

AA-613

HI-LECTRIC vibrators, featuring powerful induction motor-in-head design, are ideal for continuous use in heaviest service. Use them on bridges, culverts, heavy structures of all types and on paving jobs.

UNI-LECTRIC series motor-in-head vibrators use available 110 volt current. For sound, better looking concrete, use them on footers, curbs and gutters, thin walls, drives, floors, repairs—any light job.

listed under "Concrete Vibrators" in 85 principal cities

Find your nearest distributor in the "Yellow Pages"

Maginniss HI-LECTRIC POWER TOOLS

MAGINNISS Power Tool Company

154 Distl Avenue, Mansfield, Ohio

. . . for more details circle 276, page 16

New Equipment At The Road Show

(Continued from page 126)

Hydraulic Concrete Bucket

A hydraulic concrete bucket in which the power for operation is self-contained was displayed by Blaw-Knox Co., 300 Sixth Ave., Pittsburgh, Pa. The self-contained power feature is said to accelerate placing of concrete in eliminating use of an air hose and need of having compressed air available at the placement site. Sufficient oil is stored in the hydraulic system for emptying a portion of the bucket's load, closing the gates and then reopening them for a second pouring. When the bucket is set down the spring-loaded pendant drops, reversing flow in the hydraulic system and automatically recharging the bucket.

Blaw-Knox Bucket

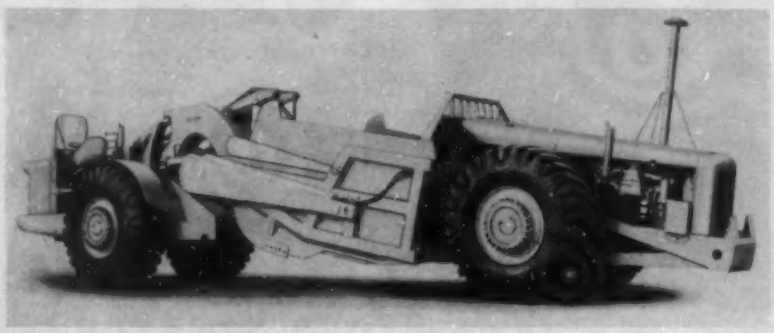
For more information circle 132 on Service Coupon Page 16 and mail now.

24-Yd. Twin-Power Scraper

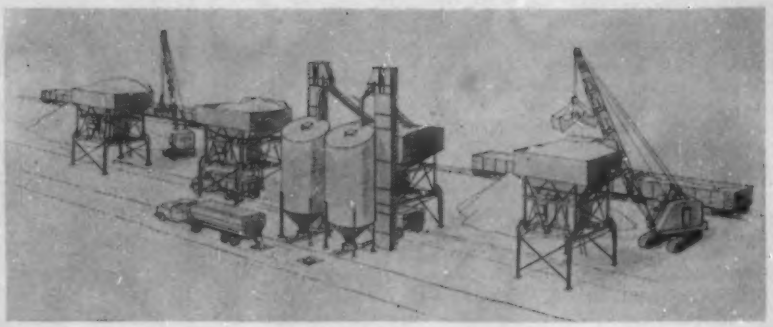
A new scraper of 24-yd. struck capacity, with a General Motors two-cycle, 6-cyl., 300 hp engine was shown by Euclid division of General Motors Corp., Cleveland, O. The new machine has an Allison series 500 torque converter, heavy duty, full-floating drive axle with single reduction carrier and planetary reduction in each wheel.

Brakes of the four shoe type are internal expanding, air actuated. Steering, full hydraulic type with two hydraulic jacks, offers a full 90 degree swing. Transmission offers three forward and one reverse speeds, full power shifting through hydraulically actuated multiple disc clutches.

For more information circle 133 on Service Coupon Page 16 and mail now.



Euclid 24-Yd. Scraper



TX4 Concrete Batching Plant

Contraction Joint Cutter

A concrete joint cutter which is said to do the job more economically than hand formed methods was exhibited by Seaman-Andwall Corp., division of American-Marietta Co., Milwaukee 1, Wis. The "Vibro-Joint" cutter brings sawed joint costs down, according to the manufacturer, and also reduces the amount of joint filler required.

The machine is self-propelled and rides either on forms or adjacent slabs. When the cutter bar is in position, the operator brings the motor up to the desired rpm until vibrating action is of proper intensity. The cutter bar is then lowered hydraulically to the proper depth in the fresh concrete. The machine is claimed to cut 3000 ft. of joints per day.

For more information circle 134 on Service Coupon Page 16 and mail now.

Concrete Batching Plant

A new batching plant claiming speed and economy of operation was introduced by Butler Bin Co., Waukasha, Wis. Described as the TX4, the plant is set up to get the greatest speed out of the batching operation, according to the company. There are separate bins for the materials and all the units of the plant are assembled so as to provide extra speed in erection and dismantling. Bins feature welded frames plus stiffeners and cross braces.

Both the electric and the pneumatic systems are shop-tested before shipment. All switches, push buttons, starter, transformers and receptacles in the service control panel are prewired and mounted in a weather tight steel cabinet. All components are in conformance to NEC and NEMA codes. The complete cabinet attaches to cement storage bin.

For more information circle 135 on Service Coupon Page 16 and mail now.

Bituminous Distributor

A bituminous distributor with a new principle of tank circulation and new spray bar were unveiled by Seaman-Gunnison Corp., 2763 S. 27th St., Milwaukee, Wis. Design of suction and discharge lines creates a constant circulation of material throughout the tank. Three advantages for the circulation system are claimed by the company: (1) complete tank circulation from end to end for uniform heating of material to required spraying temperature; (2) parallel flow through bar for uniform pressure at every nozzle; (3) series flow through spray bar when nozzles are closed to maintain tank temperature at bar and nozzles. Full tank circulation continues during bar circulation.

Seaman-Gunnison Distributor

For more information circle 136 on Service Coupon Page 16 and mail now.

Motor-In-Head Vibrator

A universal, motor-in-head concrete vibrator was introduced by Thor Power Tool Co., Aurora, Ill. A universal

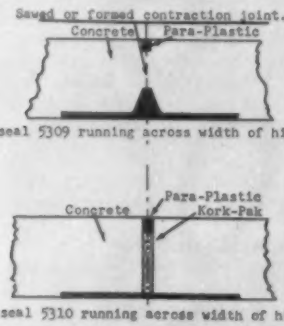
type motor operating on 115 volts, AC or DC, on 25, 50 or 60 cycle, powers the vibrating head at 15,000 rpm without load and at 12,000 rpm in 2-in. slump concrete. Triple insulated against heat and heavy loads, the vibrator has thermal controls which automatically shut off current in case of excess heat or overload.

The switch is made of high strength aluminum and is streamlined to prevent catching on reinforcing rods. The new vibrator is available in three models: CV2-10 with 10 ft. of hose; CV2-20 with 20 ft. of hose; and CV-2-210 with 10-ft. length of hose on each end of the switch. All models include a 25-ft., 3-conductor electric cable.

For more information circle 137 on Service Coupon Page 16 and mail now.

Rubber Base Plate

A rubber base plate introduced by Servicised Products Corp., 6051 W. 65th St., Chicago 38, Ill., is designed, according to the company, for elimination of water seepage through expansion and contraction joints in concrete pavement, thereby stopping pumping action which causes failure of pavement at joint intervals.



Servicised Base Plate

Baseal is available in continuous lengths of 26 ft. and a standard width of 6 in. There are two types, one designed for sawed or formed transverse contraction joints, one for transverse expansion joints. The material is placed over compacted base prior to paving in transverse position and will conform to terrain when concrete is poured.

For more information circle 138 on Service Coupon Page 16 and mail now.

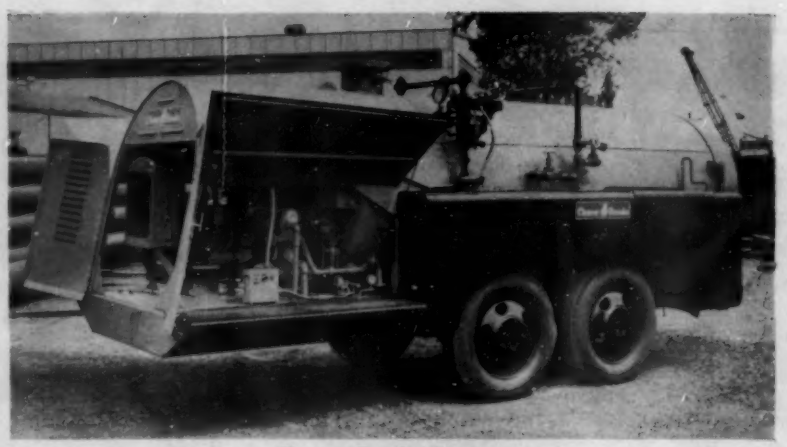
Wheel-Type Tractors

The first Work Bull wheel tractors to be shown to the construction industry were displayed by Massey-Harris-Ferguson, Inc., Racine, Wis. The new line included five tractors designed for use as primary equipment, back-up machines and utility and clean-up tools.

Among the equipment exhibited were: 52 hp model 404 with ¾ yd. loader and backhoe; 42 hp model 303 with loaders; 34 hp model 202 with side-mounted mower; model 202 forklift with standard 10-ft. mast and optional equipment permitting lifts to 21 ft.; and a Pit Bull featuring torque-converter and "foot-shift" direction-changing reversing clutches as standard equipment.

For more information circle 139 on Service Coupon Page 16 and mail now.

M-H-F Wheel Tractors



Cleaver Brooks Steamer

125 HP Portable Steamer

A portable steamer for providing fast dry steam was shown by Cleaver Brooks Co., Milwaukee 12, Wis. Called PS-125 skid-mounted or PSM-125 trailer-mounted, it will provide 4500 lb. of dry steam from a cold start in 30 minutes, according to the maker. A new light weight design offers greater mobility. A new boiler delivers 99% dry steam.

Cleaver Brooks also showed its new forced circulation oil booster. The "Peak-Temp" heater provides forced circulation at 8 ft. per second over all heated components. No refractory in furnace to replace or maintain. Even heat distribution, as determined by thermocouple tests, prevents carbon build-up.

For more information circle 140 on Service Coupon Page 16 and mail now.

143 HP Rubber-Tired Tractor

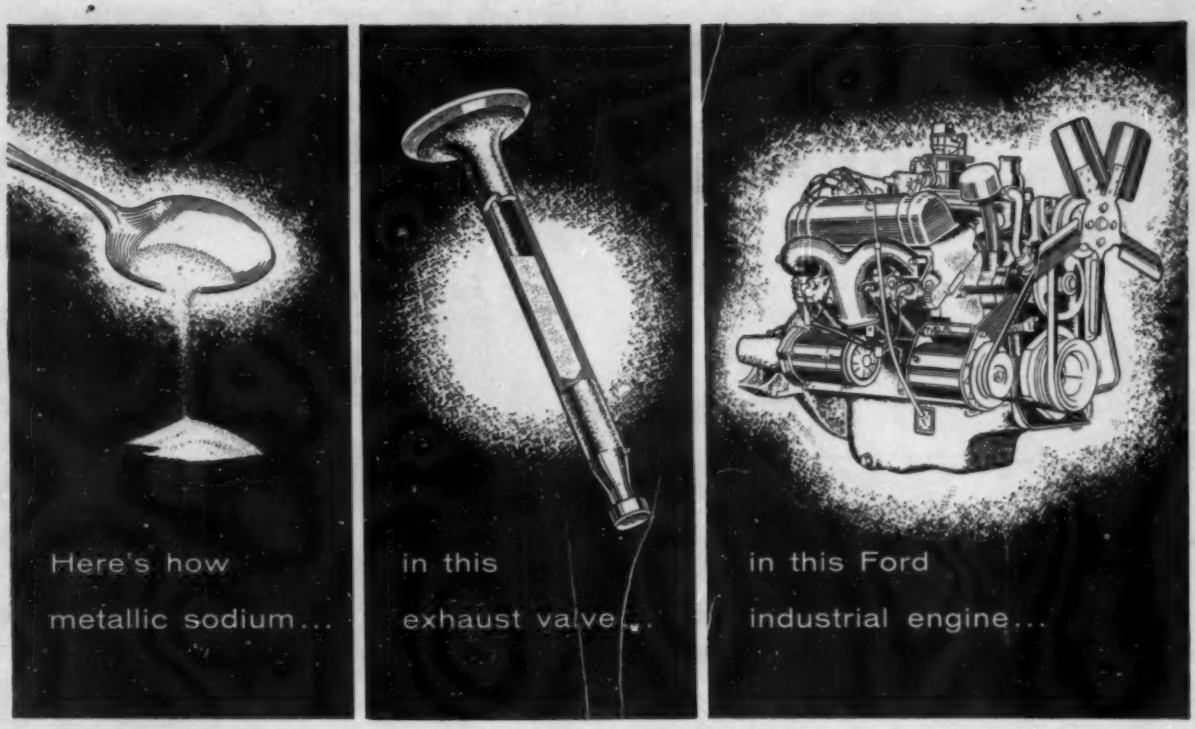
A 143 hp rubber-tired Model D Tournatractor, shown for the first time by LeTourneau-Westinghouse Co., Peoria, Ill., features a planetary steering system which provides full power even on turns.

Model D Tournatractor

The Model D has a 143 hp diesel teamed with a 5-speed earthmover type transmission. The result is a full range of speeds from 2.2-mph. for tough dozing to 19.3-mph. for job-to-job travel.

The most unusual feature of the new Tournatractor is the planetary steering system which permits turns while main-

(Continued on page 136)



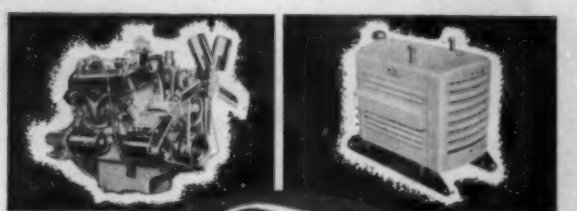
Cuts "downtime" ...lowers maintenance costs ...lengthens valve life

Sodium-cooled exhaust valves in every Ford 332 industrial engine make a major contribution towards extending Ford valve life.

You see . . . under severe, prolonged operation, Ford sodium-cooled valves prove far more durable than solid stem valves. When subjected to heat, the sodium turns into a liquid and as it moves up and down, it carries heat away from the valve head much faster than solid stems do. This, combined with integral valve guides, allows the valve head to operate up to 225° cooler. Result: a cleaner, more burn-free longer-lasting valve face—a more dependable engine.

Sodium-cooled valves are but one of *many* engine advancements Ford offers you. To name a few: deep-block construction, short-stroke design, overhead valves—yours in a full line of 4-, 6- and 8-cylinder engines, including a new super-efficient diesel.

And when it comes to service—see the Ford Industrial Products Dealer in your area. He has the facilities and experience to *keep* your Ford engine on the job—making money for you.



Ford
INDUSTRIAL ENGINES
AND POWER UNITS

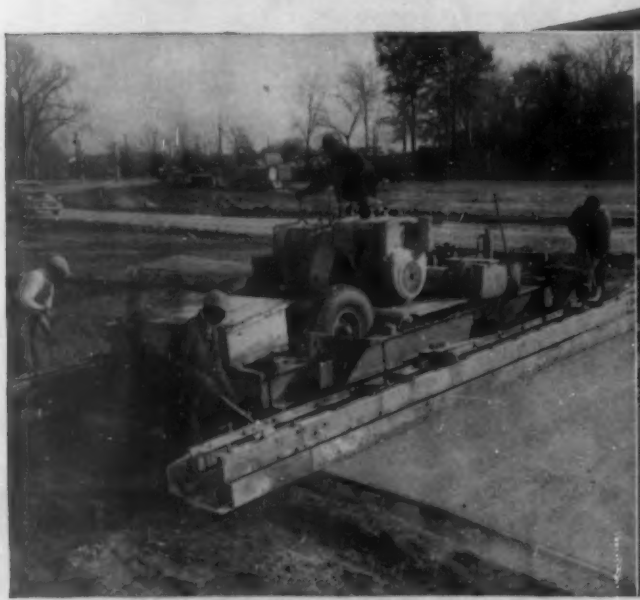
INDUSTRIAL ENGINE DEPARTMENT • FORD Division of FORD MOTOR COMPANY

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

. . . for more details circle 239, page 16

POWERED-WIDENING plus ...puts you way ahead with

Four Rex Powered-Widening Finishers assure the right size for your jobs: 10'-15', 12'-18½', 20'-25', 20'-32'. Also Model 5000 Lightweight Finisher for street paving.



Rex Concrete Finisher at work on U. S. 40 out of Indianapolis.

Cleveland job is speeded with Rex Concrete Finisher.

THE COMPLETE ROAD BUILDERS' LINE includes Rex Pavers, Paving Forms, Subgrade Planers and Testers ...Truck Mixers...Pumps...Railporter...Pumpcrete. Check coupon for complete illustrated literature.

CONSTRUCTION REX MACHINERY

PAVERS • SPREADERS • FINISHERS • FLOATS • CURING MACHINES • FORMS

CHAIN BELT COMPANY

MOTO-MIXERS • BUILDING MIXERS • PUMPCRETE • RAILPORTER • PUMPS

FULL PORTABILITY

REX® concrete finishers

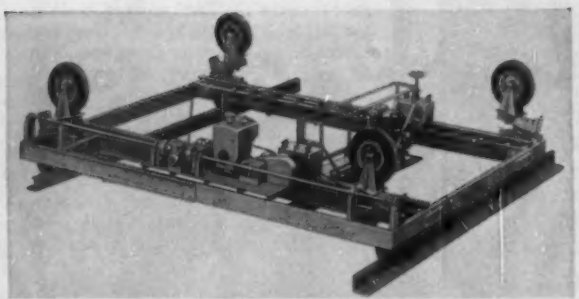
High speed...high capacity...and *highest* in operating advantages, these are your immediate rewards with Rex Concrete Finishers.

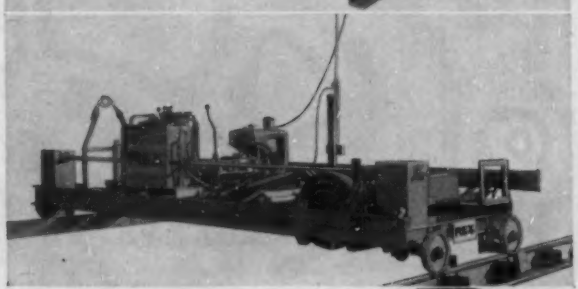
They have instantaneous powered-widening...right during operations. Width changes are made non-stop for tapered slab and interchange work. For straight lane work, you're also time ahead. They adjust to the right form size in moments.

Rex Powered-Widening is today's most advanced and trouble-free principle. With exclusive double-action design, *both* main frames are powered out or powered in *together*. It's a perfectly synchronized, foolproof system with positive, smooth chain, sprocket and rack operation. Its single lever is fast, easy.

Alone, Rex Powered-Widening is a finisher advantage that performs time-saving wonders. But note all the major work benefits of Rex Finishers...and you know why these modern, high-speed finishers are preferred by today's busiest contractors:

- **Easy-traveling portability...dual rubber-tire transportation wheels are hydraulically lowered, self-locking.**
- **Biggest screeds...16″ front and rear...hydraulic up-down operation.**
- **More speeds...fastest operation of all, full 110′ per minute travel speed. 6 forward, 6 reverse, 4 screed speeds...total 24 working combinations.**
- **Better balanced design with biggest channel frames (15″ members)...absolutely no side sway, weaving... no rocking of the forms.**
- **Smooth efficiency...ball and roller bearings used throughout...no bushings.**
- **All these advantages plus Powered-Widening with power on each main frame. No concentrating of action on a single point...no twisting, binding, etc.**





PROFIT FROM REX POWERED-WIDENING ON THESE BETTER PERFORMERS, ALSO...

Rex Float Finishers

The only longitudinal float finishers with the double-feature benefits of 2 engines...one sized right for form and float travel and the other for float reciprocation. Better finishing at a faster rate. Available with powered-frame widening and transportation rig.

Rex Automatic Curing Machines

Here's the fast operating speed that assures perfect curing jobs under the worst conditions, even on very hot, windy days when concrete is fanned dry fast. It can step up its speed 5 times the normal rate and actually overtake the paver. Powered-frame widening and transportation rig available.

get yours!

Bring yourself up to date on the industry's most complete and modern line. Mail coupon for these new, informative bulletins.

CHAIN BELT COMPANY
4652 West Greenfield Ave., Milwaukee 1, Wis.

Please forward literature which I have checked:

☐ Rex Finishers ☐ Rex Float Finishers ☐ Rex Automatic Curing Machines ☐ Rex Subgrade Planers and Testers ☐ Rex Pavers ☐ Rex Truck Mixers ☐ Rex Pumps ☐ Rex Railporter ☐ Rex Pumpcrete ☐ Rex Road and Airport Forms

Name.....

Title.....

Company.....

Address.....

City.....*Zone*.....*State*.....

. . . for more details circle 224, page 16

Stretch Your Road Dollars

Lime stabilized road under construction in Texas. Due to its whiteness, lime is readily seen as it is worked into the base, contributing to thorough mixing.

WITH
LIME STABILIZATION

LOW COST: 35-40¢/SQ. YD.*

—for 6 inches of compacted base course—complete cost except for wearing surface. Job costs have ranged from 25 to 50¢ per square yard, depending on location and specifications.

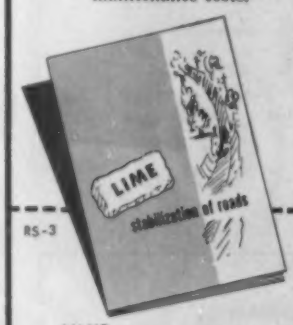
NATIONAL LIME ASSOCIATION "RELY ON LIME—TESTED BY TIME"

ECONOMICAL

- Low percentage of lime required (average 3% by weight).
- Upgrades local substandard base materials (in-place or borrow).
- Expedites construction, aids pulverization and reduces delays caused by wet weather and swampy subgrades.
- Probable reduction, in base and/or pavement thickness (as determined by stability tests).
- Permanence, leading to low maintenance costs.

OTHER ADVANTAGES

- Sharply reduces Plasticity Index of unstable clays, silts, and clay gravels in base or sub base.
- Increases Plastic Limit above critical moisture content.
- Reduces shrinkage of plastic soils and base materials.
- Greatly increases strength and stability.



Lime stabilization — 10 to 12 years successful durability experience—over 1000 miles constructed.

** Cost experience—reported by 4th Army Headquarters in survey of 8 different jobs.*

RS-3

Write for further information and FREE booklet:
"LIME STABILIZATION OF ROADS"

NAME _____

POSITION _____

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ADDRESS _____

CITY _____ ZONE _____ STATE _____

NATIONAL LIME ASSOCIATION
925 15th STREET, N.W., WASHINGTON 5, D.C.

. . . for more details circle 342, page 16

New Equipment At The Road Show

(Continued from page 131)

taining full power on all four drive wheels. The system is operated by air-pressure controls triggered by conventional steering levers. Needing no special operator attention, it adjusts sharpness of turn to forward speed automatically to provide safe sure control under all conditions. At 2-mph. it allows a sharp turn radius of about 9 ft. while at about 20-mph. the orbit extends to just under 100 ft.

A number of work tools have been tailored to the "D" Tournatractor including an 8 ft. bulldozer, an 8½ ft. snow plow and a double drum power control unit.

For more information circle 141 on Service Coupon Page 16 and mail now.

Steel Wheel Rollers

Two new designs in tandem steel rollers, rated at 5 to 8 and 8 to 12 tons, were shown for the first time by Seaman-Andwall Corp. division of American Marietta Co., Milwaukee 1, Wis. New features include a newly-designed transmission permitting three speeds in both forward and reverse, all controlled by a single lever, with no shifting or clutching required. Hydraulic power steering allows easy handling.

The machine is designed low for improved visibility, with low center of gravity adding to stability. Gasoline engines are standard, rated at 65 and 73 hp, with diesel available on special order.

Seaman-Andwall Roller

For more information circle 142 on Service Coupon Page 16 and mail now.

Novel Side Dumping Bucket for Traxcavator

A new 1½ cu. yd. side dumping bucket attachment for Traxcavators, was introduced by Caterpillar Tractor Co., Peoria, Ill.

Designed to give added versatility to the company's line of Traxcavators, the new attachment provides side dumping ability, without sacrificing efficiency in standard Traxcavator applications.

The prime advantages claimed for

Traxcavator Dumping Attachment

the side dumping bucket are in allowing the Traxcavator to perform in-line loading, eliminating the need for constant turning in order to dig and load. As well as increasing production by reducing loading time, this feature also serves to lower maintenance cost by reducing wear on track, track parts, steering and master clutches, and idlers, due to turning.

For more information circle 143 on Service Coupon Page 16 and mail now.

Combination Float-Finisher

A new combination float-finisher shown by Heltzel Steel Form & Iron Co., Warren, O., is said to perform the function of a standard transverse finisher plus the longitudinal straight edging usually done by a longitudinal float. The machine consists of two standard finishing machine frames rigidly tied together with 10-in. wide flange beams.

The eight wheels, powered with chain drive, are arranged in four bogie assemblies which are allowed to oscillate, thereby minimizing form elevation inequalities. The front screed, 16-in. wide, rides the forms and oscillates in a conventional manner. The amount of oscillation is adjustable from 3 in. to 9 in. to allow proper screeding for any mix consistency. The rear screed, also 16-in. wide, is suspended by a special hangar which permits minute adjustments by means of set screws.

For more information circle 144 on Service Coupon Page 16 and mail now.

V-8 Turbodiesel Engine

A new V-8 design turbodiesel engine which develops 375 hp turbo-charged was shown by Cummins Engine Co., Columbus, Ind. The engine features easy accessibility to valves, injectors and accessories. Fuel pump, compressor and generator are located in V on top of engine.

Turbocharger is tailored to match air flow with fuel flow characteristics. Design of the unit has been simplified to eliminate external lubricating oil lines, fuel manifolds and injector fuel connections. More economical transmissions and drives are claimed through use of higher rotative speeds.

Bore and stroke is 5 in. by 5 in. The engine makes 2500 governed rpm. Net weight turbocharged is 2850 lb.

For more information circle 145 on Service Coupon Page 16 and mail now.

25-Ton Capacity Rear Dump

An off-highway rear dump truck with a 25-ton capacity was introduced at the Road Show by Autocar division of White Motor Co., Exton, Pa. The AP-25 is available with either a 335 or a 375 hp turbo-diesel engine and is equipped with a planetary gear drive rear axle.

A special feature of the new truck is the adjustable steering wheel which can be set to fit any driver.

The all-welded box section frame is constructed of 5/8-in. steel. It is internally reinforced throughout the 5/8-in. corrugated steel plate which is plug-welded to alternate sides of the box section at 30-in. intervals and also welded to the tension member of the box section.

Autocar 25-Ton Truck

For more information circle 146 on Service Coupon Page 16 and mail now.

Improved Masonry Cutter

A masonry cutter was introduced by Rice Pump Machine Co., Belgium, Wis. The cutter, called the "Speedy," resets automatically. After a few strokes on hydraulic pump for cutting job, a touch of the handle withdraws the cutting edge to a position ready for the next cut. The machine is powered by a 12-ton pump and ram for cutting ledge stone, marble, granite, limestone and easier varieties of masonry such as brick, ledge strip stone, sawed bed stone and solid masonry.

"Speedy" Masonry Cutter

For more information circle 147 on Service Coupon Page 16 and mail now.

Aggregate Dryer and Bin

A new portable Trail-o-Dryer and dual feeder bin, said to comprise a small, low-cost aggregate dryer, was displayed by Littleford Bros., Inc., Cincinnati 2, O. The dryer and bin combination is used to feed hot pre-mixed dry material to a Littleford Trail-o-Patcher for mixing with asphalt and discharge directly into trucks without rehandling.

The dryer has a capacity of 15 tons per hour based on a removal of 5% free moisture and at a 310 degree F. discharge. The machine produces up to 25 tons per hour when drying aggregate for stock pile mixes or when moisture content is low, capacity varying with aggregate and moisture content.

For more information circle 148 on Service Coupon Page 16 and mail now.

(Continued on page 153)

Littleford Dryer and Bin

What's New
in Equipment and Materials

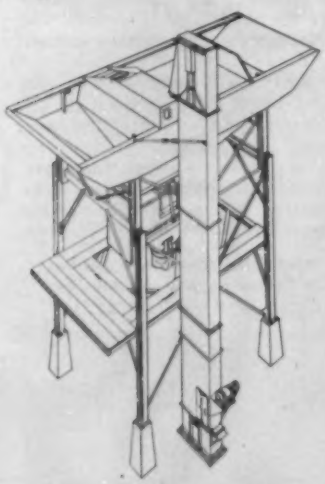
Reader Service Coupon on Page 16
See also page 85 for equipment exhibited at the Road Show

Transit-Mix Batching Plant

The new "Econoplant" batching set up, announced by C. S. Johnson Co., a subsidiary of Koehring Co., Champaign, Ill., is a complete plant facility, low cost because it is standardized in many aspects, easily erected and convenient in operation.

As a basic plant, the Johnson Econoplant has three aggregate compartments of 45 cu. yd. total heaped capacity and one 70 bbl. cement compartment. It is designed with large top openings to make clamshell charging practicable. All-welded fabrication of the bin structure helps to simplify erection and provides a maximum lift of about 5 tons. A built-in ¾ h.p. air compressor supplies air for cement aeration through built-in fittings.

A 180 bbl. per hour capacity cement elevator is furnished with the bin to handle bag or bulk cement. To comply with rigid specifications, a manually operated Johnson concentric batcher weighs cement on a separate scale and discharges it within the aggregate for minimum dusting and maximum premixing.



Johnson "Econoplant" Batching Set-up

For more information circle 149 on Service Coupon Page 16 and mail now.

Shock-Absorbing Handle for Rock Drills

New shock-absorbing handles for use with Le Roi-Cleveland hand held rock drills have been announced by Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wis. Designed to absorb recoil and vibration, the new handles are stated to reduce operator fatigue, resulting in more efficient tool

H-12 Drill With New Handle

operation and higher output at the finish of a day's drilling.

Vibration is absorbed by rubber cushions incorporated into the mechanism of the new handle, which was designed for use with Le Roi-Cleveland H-10, H-12, and H-111 sinker drills. Handle adjustment can be made to suit operator's desired degree of vibration dampening.

For more information circle 150 on Service Coupon Page 16 and mail now.

Dump Body Unloads from Individual Buckets

A new side-dump transport, manufactured by the Baughman Mfg. Co., Jerseyville, Ill., unloads from individual buckets into truck-mounted spreader bodies, large portable concrete mixers, as well as many other big, heavy-duty bulk transport assignments.

The buckets can be raised or lowered by means of hydraulic rams, which are mounted on a monorail and moved into unloading position by means of a winch arrangement. The buckets are available with or without lids. The lid folds out during discharge to form a discharge chute. Controls are conveniently located on the side of the body, and operate either a P.T.O. or auxiliary engine drive for the hydraulic system.

Side-Dump Body

Dumping height is approximately 103 in., with a per bucket capacity up to 6 tons, depending on weight and nature of material. Models with up to 6-bucket capacity are available.

For more information circle 151 on Service Coupon Page 16 and mail now.

100-Ton Hydraulic Jack

To meet increasing demand for higher capacity lifting jacks to handle extra heavy loads, Western Railroad Supply Co., 2400 South Ashland Ave., Chicago 8, Ill., has added a 100-ton two-speed hydraulic model to the line it purchased recently from the Buda Division, Allis-Chalmers Mfg. Co.

Simple in design, ruggedly constructed, the Model 100B-12 is rated at 100 tons with a lifting height of 6⅛ in. Low in height, high in capacity, it is claimed to be an ideal jack for handling such extreme loads as found in bridge building, in erection of heavy equipment and machinery moving.

100-Ton "Two-Speed" Lifting Jack

For more information circle 152 on Service Coupon Page 16 and mail now.

Post Hole Digger

A new heavy duty digger, announced by Roper Manufacturing Co., Zanesville, O., digs to the 48 in. required for setting post and guard rails, with augers available to 14-in. diameters. It is easily mounted on tractors generally used for mowing brush and weeds along highways.

Post Hole Digger

For more information circle 153 on Service Coupon Page 16 and mail now.

(Continued on page 138)

Roebling Royal Blue Wire Rope will **bend** and **bend** and **bend!**

What's more, Roebling Royal Blue is *stronger* than the strongest wire rope previously available. It will do more work and last longer on *your* job. Call your distributor or your nearest Roebling office for full information about Royal Blue, the really better wire rope. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country—Subsidiary of The Colorado Fuel and Iron Corporation

. . . for more details circle 291, page 16

"loading . . . hauling . . . dumping . . . you can't beat 'em!"

That's what Mr. Arnold R. Lyon of Harry Berry, Inc. says about their Mack LRX dumpers. As general manager of their operation in Hopkinsville, Kentucky, Mr. Lyon appreciates the dollar-and-sense value of Mack trucks.

"Since ours is mostly short hauling, the strain from loading, dumping, and steep grades really gives our trucks a tough workout. Moreover, we find that we are able to produce more work with our Macks because their balance, short turning radius, and maneuverability speed up spotting under the shovel and dumping.

"Our Macks haul 16- to 17-ton loads day in and day out . . . averaging 2 gallons of fuel per hour. In 3½ months, outside of routine servicing, we have not had a single second of downtime. But aside from the economy and performance, our drivers like them better than other makes . . . easier to handle . . . better riding . . . greater sense of confidence. Certainly, it's been our experience that you can't buy a better truck than a Mack."

Mr. Lyon has learned about Macks from experience. If you have a hauling job, especially a tough one, why not let your Mack dealer or representative tell you about all the satisfied Mack users in your area. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

4797

. . . for more details circle 268, page 16

"C's" were push-loaded in wet sand by Tournatractors or Crawlers, either singly or in tandem, depending on conditions. 'Pulls moved an average of 11 cu. yds. per trip.

Blythe Bros./Morrison-Knudsen use 8 Tournapulls, 2 Tournatractors

to speed completion of major air base

At Belle Chasse, La., about 7 miles southeast of New Orleans, a joint venture of Blythe Brothers and Morrison-Knudsen of Charlotte, N.C. and Boise, Ida. is completing the second of two runways for Alvin Callender Joint Air Reserve Training Center. This latest runway will be 6,000′ long — with 1,000′ of overrun at each end, and 8,000′ of connecting taxiways.

10 LeT-W units on the job

The contracting team started work on the 1,000,000-cu. yd. project with a large equipment fleet which included 2 LeTourneau-Westinghouse Tournatractors. Several months later, the combine brought in 4 C Tournapulls of their own to replace other earthmoving equipment operated by a subcontractor.

The "C's" did a good job — so good a job, in fact, that the contractors purchased 4 more new "C's" a year later to speed completion of the job!

Push-loading scrapers on this job are 2 Tournatractors and 2 crawlers. Rubber-tired pushers are used mainly for loading over long stretches of tough-loading, hard-packed sand. Crawlers push-load in deep, loose sand, where scrapers can pick up a full load in a short distance. Both types of pushers are used singly or in tandem—depending on materials and loading difficulty.

Haul 11-yd. loads over mile cycle

"C's" load and haul an average of 11 pay yds. per trip on a 1 mi. cycle. Loading distance averages 100′, haul 2,525′, and spread 50′. A total of 550,000 yds. has to be moved in construction of the second runway.

"Tournapulls best for job"

Foreman E. E. Pigg has this to say about C Tournapulls: "There is no other piece of equipment that would give us the service and production these 'C's' are giving. If there was, you'd probably see others out here. But it's all a 'C' job. They give us everything we ask for."

Ask about Fullpak

The LeTourneau-Westinghouse C Tournapull can do a profit-making job for you, too. Now available is an improved "C" scraper — the "Fullpak" — with a capacity of 18 cu. yds. heaped. Fullpak loads faster, boils better, heaps a bigger load. Ask us to show you how it will cut costs and shorten work time on *your* next earthmoving contract!

Tournapull swings around an edge of fill, building up low area which has been cleared of muck by draglines.

Fullpak—Trademark; Tournapull—Trademark Reg.U.S.Pat.Off. CPCT-1058-A-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

. . . for more details circle 265, page 16

WHERE QUALITY IS A HABIT

What's New in Equipment and Materials

(Continued from page 138)

Bulldozer Blade Attachment

A new 104 in. wide bulldozer blade attachment for the No. 977 Traxcavator has been announced by Caterpillar Tractor Co., Peoria, Ill.

Owners can now select the most suitable of 2 different dozer arrangements for the No. 977: the new straight bulldozer blade attachment and the previously introduced No. 977A angling blade bulldozer.

The straight blade is useful for leveling, clean up, and backfilling operations usually accomplished with the Traxcavator bucket. Its greater width makes it more efficient than the bucket for these jobs.

This new bulldozer attachment fastens to the lift arms with a bracket arrangement at the same point where the bucket connects.

For more information circle 154 on Service Coupon Page 16 and mail now.

Action Photo of Homelite Model 7-29 Chain Saw

One-Man Chain Saw

A new one man chain saw that will bring down trees 10 ft. in diameter, has been announced by Homelite, 75 Riverdale Ave., Port Chester, N.Y. Designed for the professional woodcutter, the new Model 7-29 delivers 7 full horsepower, yet weighs only 29 lb.

With its all-position, all-angle carburetor the 7-29 cuts up, down, left, right, upside down, quickly and easily with no adjustments, no loss of power. Makes any type of cut — notching, felling, bucking, boring, limbing or undercutting.

Among its many quality features, the new 7-29 offers: short-stroke, high compression design which prolongs engine life and lowers gas consumption . . . quick starting, weather-proof ignition . . integral cooling fan . . . aviation type cylinder with chrome plated bore . . . aluminum piston.

For more information circle 155 on Service Coupon Page 16 and mail now.

Automatic Blade Control for Motor Graders

A new automatic blade control made exclusively for Caterpillar No. 12 motor graders and which keeps the grader blade at any desired slope regardless of unevenness of the terrain, has been developed by Preco Incorporated, Los Angeles. The attachment is in production and limited shipments are being made to Caterpillar Dealers.

The Preco automatic blade control, according to its manufacturers, has demonstrated its accuracy in controlling slopes to within ½ in. in 10 ft. It is claimed that an operator can finish a given grade in a single pass at higher speed and with extreme accuracy, when conditions enable the blade to carry all the surplus material.

When a motor grader is equipped with the Preco automatic blade control the operator merely selects the desired slope on a dial located conveniently to the other controls. The dial is calibrated in both per cent of slope and slope ratio. The operator raises or lowers the blade as required to control the depth of cut, but the slope will remain as selected, regardless of how the grader frame may be affected by surface conditions.

For more information circle 156 on Service Coupon Page 16 and mail now.

UNION BUILDING chose Brunner & Lay ROK-BITS for rock removal on CONNECTICUT TURNPIKE

Biondi Bit & Drill Steel Co. delivering Rok-Bits to Union Building's field warehouse. 2¼"; 3" and 3½" Rok-Bits being used. Get details on the use of 2¼" bits for faster deep hole drilling.

Moving nearly one million yards of rock on Section 320-01 of the Connecticut Turnpike presented special drilling problems for The Union Building & Construction Corporation, of Passaic, N. J. Drilling granite, up to monumental hardness, Union Building increased their footage and reduced bit changes by using Brunner & Lay Rok-Bits.® Pulling extension steel was not necessary on lifts of 20 to 25 ft. thanks to Rok-Bits ability to hold their gauge and cutting edge. Time was saved. Costs hold in line. Write for details on this job, also on other Rok-Bit drilled turnpike jobs.

Carbide Rok-Bits—cross, chisel, "X", cutaway, taper socket bodies—standard, J-7.50; 200; 400; 600 types—gauge sizes—1¼" thru 6". Request new catalog #756.

Brunner & Lay Products

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. • Brunner & Lay Rock Bit of Philadelphia, Inc., 2514 East Cumberland St., Philadelphia 25, Pa. • Brunner & Lay of Los Angeles, Inc., 2425 East 37th St., Los Angeles 58, Calif. • Brunner & Lay, Inc., 150 Leslie St., Dallas, Texas • Brunner & Lay Rock Bit of Asheville, Inc., Sweeten Creek Rd., Asheville, N.C. • Brunner & Lay of Portland, Inc., 660 N. Tillamook St., Portland 12, Ore. Birmingham Rock Bit Co., Inc., 5-18th St., S.W., Birmingham, Ala.

. . . for more details circle 212, page 16

Truck Mixers

A new line of fast charging and discharging "F" model truck mixers, stated to offer major design advancements and several hundred pounds reduction in weight has been announced by the Jaeger Machine Co., Columbus 16, O. Choice of 3-speed automotive or hydraulic reversing transmission is available with separate engine drive or either front-of-engine or transmission power take-off. Design of front trunnion stand makes possible 4-in. shorter center of gravity in p.t.o applications. Rear drum cradle is of open-type design to prevent build-up of material and the drum rollers are fully enclosed with grout-proof bearings. All body weight is carried within the width of the truck frame.

Revolutionary water measuring tank in which a new type of controlled gravity feed replaces syphon feed, now eliminates all need for self-priming pumps, goosenecks, special valves or fittings. A 1½-in. straight centrifugal pump of simplified, compact design and increased (60 gpm) capacity, is now standard on all models. Rear water entry is standard; front-of-drum entry with grout-proof water jet is optional.

A lighter, more easily handled and more accessible chute assembly is also featured.

Jaeger Model F Truck Mixer

For more information circle 157 on Service Coupon Page 16 and mail now.

Iron Powder Electrode

A new line of iron powder coated hard facing alloys has been developed by Alloy Rods Co., 3536 Lincoln Highway West, York, Pa.

The new electrodes are manufactured in three types. Wear-Arc 3 I. P. for build-up of worn parts, Wear-Arc 6 I. P.—an electrode with excellent resistance to abrasion, i, pact, and compression, Wear-Arc 12 I. P.—where extreme resistance to wear caused by heavy impact and abrasion is required.

For more information circle 158 on Service Coupon Page 16 and mail now.

Ripper

A new ripper for use with Caterpillar 60 in. gauge D4 tractors has been announced by Caterpillar Tractor Co., Peoria, Ill. Designated the No. 4 ripper, the new tool is designed for use with 60-in. gauge D4 tractors having grouser widths up to 18 in.

A design feature of the No. 4 ripper

Caterpillar Ripper

is its parallel linkage, which maintains a uniform ripping angle at all penetration depths. This not only produces maximum ripping action, but also protects the hydraulic system by reducing cylinder pressure.

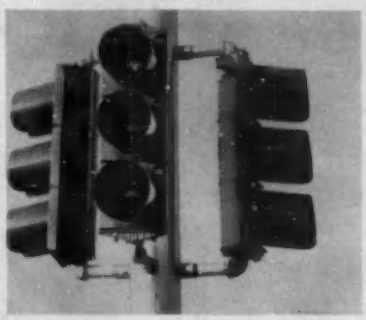
The new tool is equipped with three alloy steel teeth having replaceable tips. Two additional teeth are available on an optional basis. Since these ripping teeth are removable, the No. 4 ripper is provided with three notable features. First, this feature provides the user a choice of the number of teeth to be used—from one to five. Secondly, when ripping to the edge of vertical walls or banks, the teeth may be inserted backwards, and ripping performed while backing up. Also, by inserting the teeth upside down when not in use, additional ground clearance may be obtained.

The tool is designed to afford maximum ground penetration of 32 in., ripping width up to 71 in., and 15¼ in. ground clearance when fully raised.

For more information circle 159 on Service Coupon Page 16 and mail now.

Clamp for Traffic Signs

A new, patented aluminum blind clamp for mounting all pedestrian indications is available from Pfaff & Kendall, 84 Foundry St., Newark, N.J. The clamp does away with the usual band-type fastener and permits level and symmetrical mounting of all indicating units, presenting a neat, efficient appearance. Installation time and trouble are said to be minimized through use of this method of mounting.



Clamp for Traffic Sign

For more information circle 160 on Service Coupon Page 16 and mail now.

Aggregate Conveyor System

An advanced design aggregate handling conveyor system, "The Mighty Mole," has been announced by Triangle Engineering Co., 4655 Southwest Highway, Oak Lawn, Ill.

The system is made up of a tunnel section, inclined conveyor belt, turnhead chute and electrically operated control panel. It is adaptable to road construction, operation of material yards, or any material batching operation.

Loading gates in each section of the tunnel permit materials to be placed on the conveyor belt and brought to the chute heads in controlled sequence where they are delivered to bins or trucks below. The entire operation of tunnel, inclined conveyor, turn-head chute etc. is directed from master electrical panel in control tower.

The system is flexible and may be set up for many different sizes and types of operation.

Mighty Mole on Location in Mansfield, O.

For more information circle 161 on Service Coupon Page 16 and mail now.

½ Ton Truck Hoist

Powered by the truck battery, the new Pacific portable hoist lifts or lowers a ½ ton quickly and efficiently. This low cost hoist features an adjust-

Pacific Portable Hoist

able boom height and length, a 360° swing and remote push button control. It can easily be removed from the truck body to a shop dolly in the matter of minutes.

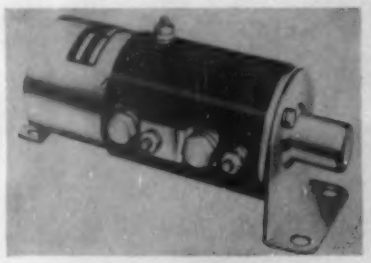
For more information circle 162 on Service Coupon Page 16 and mail now.

Switches for Motor Starting

A new line of heavy-duty series-parallel switches, featuring both 12 and 24 volt models, has been announced by the Leece-Neville Co., 1374 East 51st St., Cleveland, O.

The new units make possible the use of 24 volts for starting motors on vehicles and engines having 12-volt electrical systems. They are applicable to trucks, buses, tractors and other off-highway equipment. A single unit L-N series-parallel switch replaces two switches in the usual series-parallel system with Bendix drive.

Since the single switch replaces the two previously required, there is less wiring on initial installations, mounting costs are thus reduced, and the possibility of line losses is minimized. Also, less current is required to operate the coil of the one switch than the former two units needed.



L-N Series Switch

For more information circle 163 on Service Coupon Page 16 and mail now.

Front End Loader

A new line of tractor-mounted front end loaders, announced by Superior Equipment Division (of Superior Pipe Specialties Co.), Wheeling, Ill., feature a new extra-strong tubular frame, part of which acts as a hydraulic oil reservoir.

Bucket rams are mounted so that they cannot "spring" and hydraulic piping is enclosed in loader arms for protection.

The loaders are stated to have an especially strong "pry-out" action for heavy or frozen loads. They can be mounted on most models of low silhouette four-wheel industrial tractors.

Superior Loader Model H228

For more information circle 164 on Service Coupon Page 16 and mail now.

Manhole Guard Rails

New guard rails for the protection of men working underground have been announced by T. J. Cope, Inc., Third and Walnut Sts., Collegeville, Pa. The

Manhole Guard Rails

guard rails are made of steel pipe and tubing with all fixed joints welded. Many are equipped with the Cope wing bow brace which assures a rigid barrier on 3 sides. The 4th side is protected by chains. The chains can also be used for locking the rail to standing equipment or to poles while not in use. The guard rails are available with spreader bars, flag holders, steel aprons on which inscriptions or company names can be placed, and sign panels.

For more information circle 165 on Service Coupon Page 16 and mail now.

Air Compressors

Lightweight air-cooled compressors in a compactly-designed medium-capacity range, the new CT series recently developed by their Swedish affiliate, have been added by the U.S. Atlas Companies to their compressor sales-and-service divisions.

CT Series Compressor

New models include the 45 hp CT-4 developing 175 cfm, and the 75 hp CT-6 delivering 340 cfm. Skid-mounted, their weights of 1,300 and 1,900 lb., respectively, are claimed to be especially suitable for mining exploration, construction projects, and similar temporary location work where water either is unavailable or too costly to be used for machine cooling.

Illustrated literature on the new CT compressors is available from Compressor Division, Atlas Copco Pacific Inc., 930 Brittan Ave., San Carlos, Calif., or Atlas Copco Eastern Inc., Patterson, N.J.

For more information circle 166 on Service Coupon Page 16 and mail now.

Angle Adapter for Vises

A new angle adapter to permit movement of Gyro-Vises up and down in an arc, has been announced by the Columbian Vise & Mfg. Co., Cleveland 4, O.

The manufacturer advises that, with this adapter, the vise can be placed in any position required by any user. The adapter is also said to greatly increase the versatility of this vise which normally operates from and rotates around a standard base. The Gyro-Vise works equally well in any upright or "on-its-side" position.

Columbian Gyro-Vise Angle Adapter

For more information circle 167 on Service Coupon Page 16 and mail now.

Replaceable Digger Teeth

Completely new design principles have been used in the Bulldog replaceable digger teeth for shovel dippers, back hoe buckets, dragline buckets, clamshell buckets and loader buckets, announced by Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, O.

A Bulldog replaceable digger tooth has only three parts. First, a universal weld-on adapter that is easily attached by using the old tooth as a base. Second, an easily changed replaceable tip, and third, two positive lock pins for securing the tips to the adapter.

Bulldog digger teeth are attached in three easy steps by burning off the old tooth to the adapter size; welding on the adapter; and securing the replaceable tip to the adapter by tapping the pins in place with a hammer.

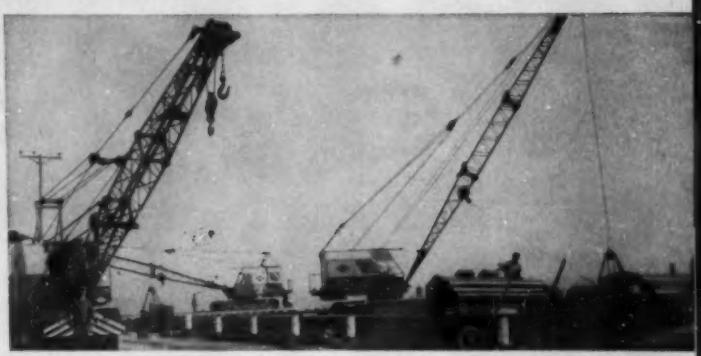
For more information circle 168 on Service Coupon Page 16 and mail now.

(Continued to page 151)

Lima Type 604 lowering pile into position on the Manahawken Bay Bridge, Ocean County, N. J.

Lima Type 604 dredging sand from single-cell cofferdam prior to driving piling.

LIMAS proved to be everything Brann & Stuart wanted in heavy-duty precision-type cranes



Lima Type 34-T (left) and two Type 604's, part of the Brann and Stuart Company's team of eight Limas.

Says *Amos Rogers, Jr., president* of Brann and Stuart, Philadelphia, Pa., "We purchased our first Lima machines in 1950, and they proved to be everything we were looking for in heavy-duty precision-type cranes. In 1952 we purchased two additional Lima rigs, and, right now, we have a fleet of eight Limas, made up of 2 Lima 34's, 2 Lima 34-T's, 3 Lima 604's and 1 Lima 703-SC.

"Our operating people like the Lima ease of operation, and they have proved very economical to run. Our distributor has given us excellent service on these machines whenever we have needed it."

Brann and Stuart's contract calls for construction of 16 piers and 2 abutments for the Manahawken Bay Bridge job, Ocean County, N. J. The work involves building large cofferdams for founding these elements. It is here that the Limas, with their high maneuverability, come into use, dredging the sea bottom to the necessary depth. Read what Mr. Rogers has to say about how they are performing: "It is on this type of work that our Lima machines really excel for us. You may be sure we have been very well pleased."

This contractor's experience is typical of many others—get to know Lima quality, and you'll want more of them working for you. It will pay you to get complete details on the Limas with capacities best suited to your job requirements. Call your nearby Lima distributor today, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

BALDWIN - LIMA - HAMILTON

Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

. . . for more details circle 207, page 16

buy from the line of strongest design... Hercules!

Hercules Model 1215 high-speed telescopic hoist and CD-20 batching body handles four 5,150 lb. batches for J. A. Jones Construction Co.

for high-speed, cost-cutting batching work...

New Hercules hoist raises and dumps *in less than 6 seconds!*

2,500 ft. of 24 ft. x 9 in. slab per 9 hour shift! That's the amazing production pace maintained by J. A. Jones Construction Co., Charlotte, N. C. on a recent by-pass job near Mansfield, Ohio—thanks to Hercules' new high-speed telescopic hoists.

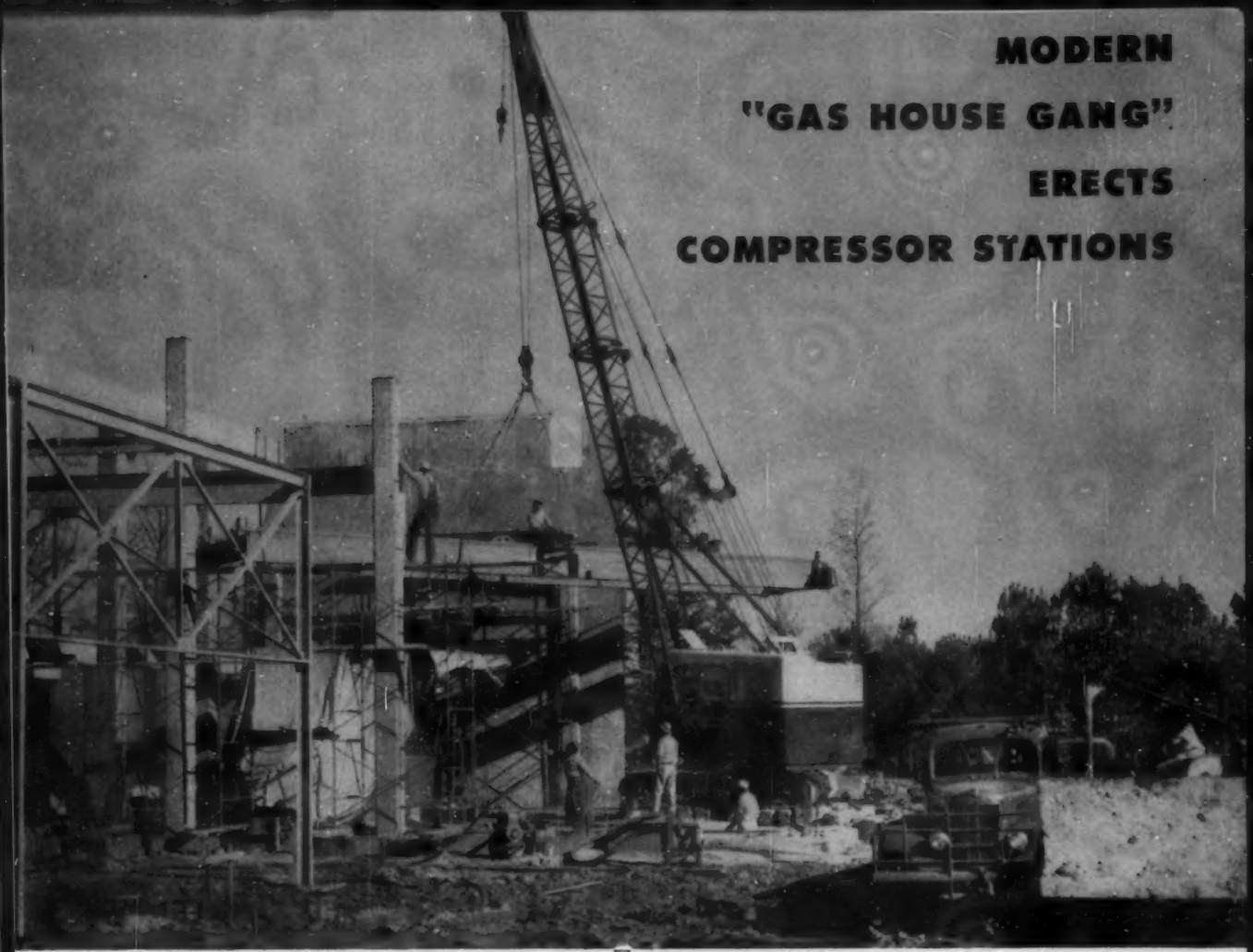
Because the batch trucks could back into the skip, dump, and pull clear *in 11 seconds*, the dual-drum pavers were able to deliver a 37.4 cu. ft. mixed batch at 51 second intervals!

Especially designed for Jones' use on this job, the new Hercules high-speed hoist raises to full dump position in 4 to 6 seconds. A special new bleeder valve provides hydraulic cushioning at the end of the lifting stroke. And, accelerating the truck engine at the top of the stroke provides a rapid 4 to 10 in. rising and falling motion of the truck body. Complete, clean dumping of each batch is assured, without "frogging" the truck. According to the contractor, Hercules 6 second, 4 batch equipment has reduced his investment in batching trucks 20%.

See your Hercules distributor . . . he'll show you how this new hoist and batching body can boost production and cut costs on your paving jobs, too. Call him now! AA-4812

HERCULES STEEL PRODUCTS COMPANY, GALION, OHIO

. . . for more details circle 336, page 16



MODERN "GAS HOUSE GANG" ERECTS COMPRESSOR STATIONS

A "gang" of Marion 35-M cranes is helping J. F. Prichard & Co. of Kansas City rush construction of four new compressor stations on a Gulf Interstate Gas Company transmission line.

The 30-inch line originates in southern Louisiana and terminates in Kentucky, where the gas is distributed to customers in Kentucky, West Virginia and Ohio. The new stations are strategically located to add about 20,000 compressor horsepower on the main line to help stabilize pressure when extreme loads are thrown on the line during winter months.

Modern design tilt-up construction of the stations means many maximum lifts for the Marions, and these sturdy 18-ton cranes are meeting the challenges of the job without a strain. The work also requires fast front end conversion from crane to clamshell to dragline. Since the Marions convert without machinery changes, construction of the stations has moved at a fast pace.

Fast-acting, easy to operate Marionair Controls have proved valuable on the many precision lifts needed to install heavy and expensive machinery in each station.

Your Marion distributor will be glad to explain how a gang of husky 35-Ms could bear the brunt of your work load. Contact him today!

. . . for more details circle 330, page 16

MACHINE	SHOVEL CAP. IN CU. YDS.	HOE CAP. IN CU. YDS.	CRANE RATINGS		
			CRAWLER MOUNT MAX.* STABILITY	MAX. USABLE	TRUCK MOUNT MAX. USABLE
MARION 35-M	¾	¾	18T @ 10′	18T @ 10′	25T @ 10′
MARION 43-M	1	1-1¼	27T @ 10′	27T @ 10′	35T @ 15′
MARION 362	1½	1½-2	43T @ 12′	30T @ 15′	
MARION 87-M	Special Crane		150T @ 12′	75T @ 15′	
MARION 93-M	2½	—	80T @ 12′	50T @ 15′	
MARION 101-M	3	—	84T @ 12′	57T @ 15′	
MARION 111-M	4	—	110T @ 15′	105T @ 15′	

*For Comparison Purposes Only

MARION POWER SHOVEL CO.

MARION Marion, Ohio, U. S. A.

Please send me bulletin No. 431 on the Marion 35-M.

Name _____ Title _____

Company _____

Address _____

City _____ State _____

(130)

TREMENDOUS RIPPING TEAM

The tremendous power of the IH TD14, TD18 or TD24, plus the 10,000-pound Greenville tractor-mounted rock ripper shatter rock and packed earth for easy scraper loading. On many jobs explosives, shovels and trucks are eliminated.

Put this power-packed team to work for you. Your IH dealer can give you the facts. Let him show you how you can save as much as 25% on any earth or rock moving job.

LIVE SWIVEL ACTION

Shanks swivel 15° in either direction . . . follow tractor like a trailer. Points have live action that shatters rock like a jack hammer.

RUGGED POWERFUL SHANKS

Scientific contour gives extra strength at strain points and pulls points down deep . . . rocks roll out and clear of headframe. Made of tough, heat-treated, manganese-moly steel. Mount one, two or three shanks as needed.

POSITIVE CONTROL

Double-acting hydraulic system provides finger-tip control and puts full tractor weight on points for fast, deep penetration.

DRAWBAR TAKES PULL

The ATECO drawbar replaces the tractor drawbar and drawbar brackets. Clevis is accessible with ripper installed.

RIP AT ANY DEPTH

Easily adjusted to permit settings as deep as 24". Points are always at most desirable angle for best penetration and splitting action. Points are easily replaced.

WRITE FOR Greenville Bulletin IH-156. It gives complete data on the Greenville-Ateco ripper.

ATECO

GREENVILLE
STEEL CAR COMPANY

ATECO DIVISION
Greenville, Pennsylvania

. . . for more details circle 335, page 16

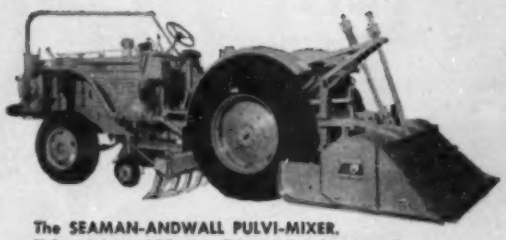
Shoulder to Shoulder—
and on Shoulders, too

SEAMAN-ANDWALL PROVIDES HIGHER DENSITIES AT LOWER BUDGETS

The SEAMAN-ANDWALL Pulvi-Mixer and the Self-Propelled 7-20 Ton Pneumatic Compactor are perfect partners in achieving high density stabilizations. Whether the job be of native soils, soil-cement, bituminous binder or chemical additives the Pulvi-Mixer provides a basic mix that rolls out to the tightest, highest load-bearing, weather resistant base or sub-base. When the Pulvi-Mixer completes its work the mix remains shaped to final grade and crown ready for immediate compaction. No finish blading is needed.

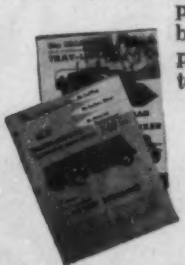
The Pneumatic Compactor . . . Adjustable to any weight between 7 and 20 tons, the Compactor retains the ideal placement and arrangement of coarse and fines which the Pulvi-Mixer established. Because power is applied to the front rolls only presure is "straight down" so there is no displacement of materials, no scuffing and no surface shear.

Most maneuverable of all the heavyweights the COMPACTOR turns 180° on a 21 foot road. The operator sits sideways to forward travel, a position in which he has complete visibility of the rolling operation and best control for close-up work. Self-propelled, it is quickly moved from job to job under its own power.



The SEAMAN-ANDWALL PULVI-MIXER.
7 ft. mixing width, gasoline or diesel powered.

The SEAMAN-ANDWALL Self Propelled 7-20 Ton Pneumatic Compactor.



Plan now to make the Pulvi-Mixer and the Compactor your primary, cost-cutting equipment. Send for these two Bulletins completely describing both units. Jot on a postcard "Bulletins TPS and PC" right now and mail it today.

STABILIZING THE WORLD

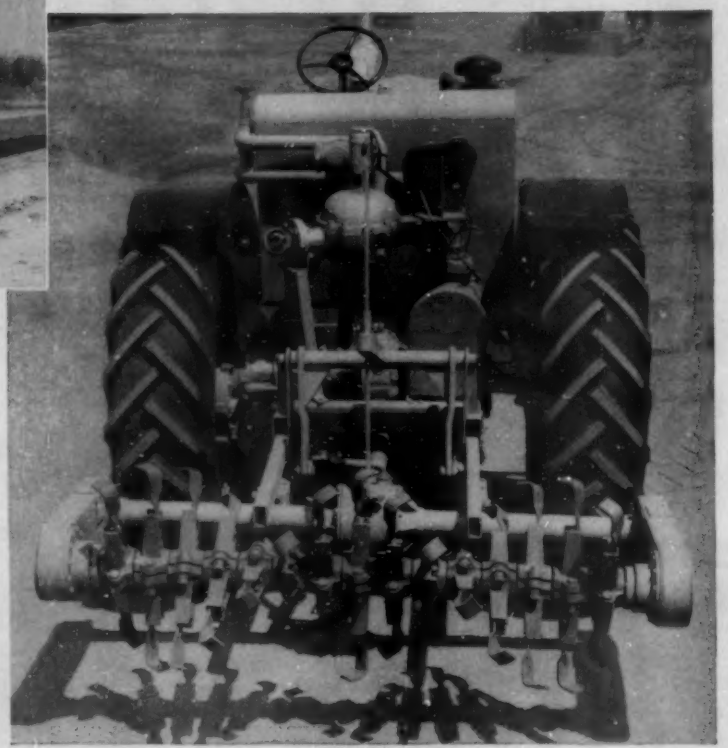
SEAMAN-ANDWALL CORPORATION

Division of American-Marietta Company
Dept. No. R-229
MILWAUKEE 1, WISCONSIN

. . . for more details circle 295, page 16

Look at These Outstanding Features of the Pettibone Wood SPEED MIXER

...THE COMPLETE TRAVELING MIXING PLANT THAT MIXES, BLENDS AND PULVERIZES



ONE ENGINE FOR ALL POWER
The preferred high-pressure by-pass binder injection system of the big Pettibone Wood Roadmixers is used in the Speed Mixer. This system operates from the same engine which provides power for the rotor and traction. *The binder flow is controlled by a valve and is not dependent upon the engine RPM.* This system permits synchronizing travel speed and mixing, thus simplifying the entire operation and reducing maintenance and fuel costs.

POSITIVE DUAL-CHAIN DRIVE
The rotor shaft is chain-driven from both ends—*not center driven*—resulting in positive drive and *stable, balanced power.* This produces a uniform mix all the way across the rotor.

CLEAR, HEAVY-DUTY ROTOR
There are no mechanical obstructions on the rotor, constructed with fewer moving parts for heavy-duty, uniform mixing, blending and pulverizing. Shear couplings prevent rotor damage. There are no rotor clutches to wear out!

ONLY 30 HEAVY-DUTY TINES
30 heavy-duty tines do all the work. The advantages are obvious—less maintenance, easier replacement, thorough mixing without jam-ups. You would expect the simplest and most effective design from the originators of mix-in-place roadbuilding equipment.

DESIGNED BY CONTRACTORS
The Speed Mixer incorporates specific features requested by contractors. Not a "compromise" piece of equipment, the Speed Mixer was designed to do the job in the simplest way with the least operating and maintenance cost.

The Speed Mixer is the answer to more economical, speedier construction and reclamation of farm-to-market and access roads, highways, streets, airports and parking lots. In a modest-cost unit, the Speed Mixer incorporates all of the proved features of travel-plant mixing, plus pulverizing, blending and material processing from the quarter-century of Pettibone Wood experience in pioneering big-capacity mix-in-place equipment for soil-cement and bituminous stabilization.

The Speed Mixer *pulverizes* hard soils, adobes, clays and light bituminous mats to aggregate size ready for in-place mixing—*blends* existing soils or combinations with imported aggregates into a thorough, uniform mix—*mixes* all aggregates with all binders, soil-cement or bituminous.

When you see the Speed Mixer in operation, you will agree that no other equipment equals it in performance and maintenance cost. Ask for a demonstration, without obligation!

Write for FREE Booklet on ABC's of Soil-Cement Stabilization

Describes the cost-saving subgrade building method that assures longer surface life for highways, roads, streets, parking lots and airports.

PETTIBONE WOOD MFG. CO.

Originators of Mix-in-Place Roadbuilding Equipment
6900 Tujunga Avenue, P.O. Box 620, STanley 7-3281
North Hollywood, California
Subsidiary of PETTIBONE MULLIKEN CORP., CHICAGO 51, ILLINOIS

. . . for more details circle 287, page 16

What's New in Equipment and Materials

(Continued from page 144)

Forged Wedge Head Rock Bolts

Capable of sustaining a 40,000 lb. pull-out in hard rock, a ¾ in. steel rock bolt with a forged anchoring head and expansion shield avail for tunnel work and general construction purposes, has been announced by Bolt and Chain Division, Republic Steel Corporation.

Developed originally as a "mine roof bolt" for use in coal and ore mines, the bolt has passed tests in Republic Steel's own mines for pull-out registering 10,000 lbs. more than the showing of slotted type bolts and square head type bolts with expansion shells. The bolt provides support by typing rock together. It is intended to provide maximum shoring safety in stratified and unstratified rock for ribs, walls and roofs in all types of tunnels, aqueducts, railroad side cuts, building foundations, dams and other permanent construction. Used in proper number and patterns, the bolt will all but do away with the need for timber shoring, the company says.

The anchoring end of the bolt has a wedge head and shield; the exposed end is roll threaded. It can be obtained in stock lengths from 2 to 8 ft., or can be made on order to any specified length.

To install, the bolt is inserted wedge end first to the desired depth in an anchoring hole just large enough to admit the shield. A square steel plate and a nut are placed on the threaded end of the bolt which projects any desired distance from the hole. As the nut is tightened, the cone shaped wedge is pulled down through the inverted cone shaped shield, causing the serrated metal edges of the shield to spread out and anchor into the side of the hole.

For more information circle 169 on Service Coupon Page 16 and mail now.

Truck Tire Has Steel Wire Shield

A new line of truck tires with a steel wire shield between tread and carcass, designed especially for transit mixers, dump trucks and heavy service equipment used in logging, mining, quarrying and road construction has been announced by United States Rubber Co., 1200 Avenue of the Americas, New York 20, N. Y.

The steel shield is stated to protect the tread from cut and rupture damage, and to virtually eliminate groove cracking. An extra-deep tread is stated to give much greater mileage on the new Super Fleetmaster tires.

Wide angle grooves minimizes stone retention, and the three-rib tread increases stability and improves steering. The tread has numerous biting edges to reduce skids, and to provide excellent traction both on and off the highways.

For more information circle 170 on Service Coupon Page 16 and mail now.

Trench Hog for New Tractors

The Arps Corporation, New Holstein, Wis., has announced that its heavy duty Trench Hog is now available for the new Ford 800, Ferguson 40, Massey-Harris 50 utility and John Deere 420W tractors.

Adaptation of the heavy duty Arps trencher to these new model tractors now makes the Trench Hog available for most all popular make tractors.

The Arps Trench Hog is a versatile, low cost trencher capable of handling big yardage jobs. It is available with three boom lengths, providing digging depths of 3½, 5½ and 7 ft., with quick change cutters furnished in from 6 to 20 in. widths. Special cutters are available for rocky and frozen ground.

For more information circle 171 on Service Coupon Page 16 and mail now.

Accelerator Prevents Concrete Freezing

A new accelerator that is claimed to make it possible to pour concrete safely down to 15° F., has been announced by Forrers, a division of Spray-O-Bond Co., 2225 North Humboldt Ave., Milwaukee 12, Wis. This new improved accelerator for portland cement is stated to lower the freezing point and to speed up setting. It also is stated to increase strength and workability.

This solution is available in 1, 5, 30 and 55 gal. drums and is easy to measure by just adding to gauging water used in each mix. Rust inhibitor added to the mix prevents it from effecting reinforcing steel or tools.

For more information circle 172 on Service Coupon Page 16 and mail now.

Heavy-Duty Wagon Drill

A new, heavy-duty wagon drill, with the feed shell behind the center line of the large wheel axles providing a more substantial drilling carriage, and with an air motor feed stated to eliminate most sticking of steel, has been placed on the market by the Le Roi Division of Westinghouse Air Brake Co., Milwaukee 1, Wis.

Designed for vertical or horizontal drilling in hard formations, the DR40 is light in weight, making it maneuverable in rough terrain. Added strength is obtained through the use of a light-weight, welded tubular U bar. Adjustable swivel wheels are quickly and easily locked into position for line or face drilling. The entire unit, including feed shell and D14DR 4 in. drifter, weighs only 1,500 lb.

Recommended for use with the new wagon drill, the D14DR drifter weighs 126 lb. It is used with a 13-ft. feed shell weighing 400 lb. and having a feed travel of 10 ft. It is stated to be possible to drill holes at any angle in any direction to a depth of 24 ft. without using steel racks. Smooth feed results from a chain take-up adjustment.

For more information circle 173 on Service Coupon Page 16 and mail now.

Spreader Has New Type Conveyor

A completely new Model Y sand, salt and cinder spreader, manufactured by Highway Equipment Co., Inc., 616 D Ave. Northwest, Cedar Rapids, Ia., features a new type conveyor for truck-mounted spreaders. By means of an oscillating main conveyor feeding a cross oscillator, material is delivered to the spinner disc. The oscillating conveyor system eliminates chain and rubber belt conveyors completely. The spinner is mounted on the left front side of the unit just ahead of the rear truck wheels.

The Model Y is a completely self-contained unit and can be mounted on a truck chassis with only four bolts. The hydraulic system is driven by an air-cooled gasoline engine mounted at the rear of the unit. Controls for engine operation can be mounted in the truck cab. By placing the spinner on the left side of the spreader and ahead of the rear truck wheels, additional driving traction is given. A safety feature is also provided by spreading material ahead of the front wheels, giving greater steering traction. The unit has been given full field tests under actual ice and snow conditions. Special design enables the Model Y to spread from one lane to an entire 4-lane highway while traveling in the right hand lane.

For more information circle 174 on Service Coupon Page 16 and mail now.

Portable Soil Tester

Loads equivalent to 36 tons per square foot on a 2½ in. diameter sample can be applied instantaneously with the new portable physical soil testing machine introduced by the Tinius Olsen Testing Machine Co., 5613 Easton Road, Willow Grove, Penn.

Designed to meet the demand for a higher capacity consolidation tester, this new K-W Conbel Model 352, which weighs only 40 lb., has a maximum capacity of 2600 lb. at 100 psi with a sensitivity of ⅛ to ¼ percent of full load. Loads are applied by air pressure by means of a piston inside a rubber diaphragm, which eliminates a spring constant.

For more information circle 175 on Service Coupon Page 16 and mail now.

Trucks for Gravel Hauling Are Highway Maintenance

A new, heavy-duty all-wheel drive truck series, engineered and built especially for gravel hauling and highway maintenance, has been announced by Oshkosh Motor Truck, Inc., Oshkosh, Wis. These trucks are an adaptation of

WHY
Hand-Stitched
Leather Covers
Give
EXTRA LONG WEAR

• CLOSER STITCHING HOLDS TIGHTER
• UNIFORM STRESS PREVENTS TEARING

LUFKIN CHROME CLAD ANCHOR STEEL TAPES

The everlasting choice in long steel tapes! Handsome, top-quality, leather case is hand-stitched over rust-resisting metal liner. Hand-stitching ensures a better, longer wearing outside cover. Exclusive Chrome Clad line is rust and corrosion resistant — will not chip, crack or peel. Bold black markings can't wear off. 25 - 50 - 75 - 100 foot lengths.

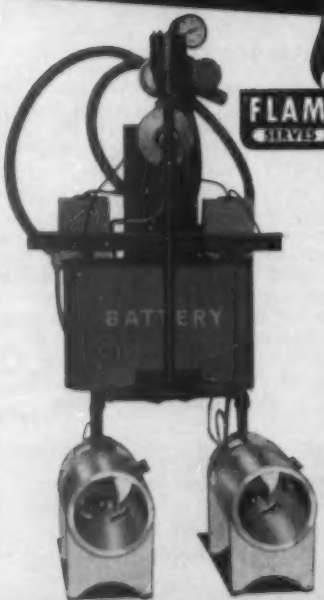
BUY LUFKIN
TAPES • RULES
PRECISION TOOLS
FROM YOUR SUPPLY STORE

THE LUFKIN RULE COMPANY
SAGINAW, MICHIGAN

400 BETTER MEASURE WITH

. . . for more details circle 273, page 16

FLAMEGAS INTRODUCES NEW
ASPHALT & TAR KETTLE BURNER



SPEEDS UP WORK
SAVES YOU MONEY
OPERATES ON PROPANE (LP) GAS
BURNERS GUARANTEED

- Speeds up heating of tar, asphalt and pitch.
- Compact, portable unit available with single or multiple burners.
- Burner operates on 6 or 12 volts, an electrical system or stand-by battery.
- Easily mounted and transported. No downtime, always operates.
- 2000° temperature—no soot, no carbon, no flues to clean.
- No messy oil drums, to collect refuse or water, or topple over.

Flamegas ASPHALT and TAR KETTLE BURNER speeds up heating. After burner is lit, set controls operate with complete safety. You're set to go when your work crew arrives.

FLAMEGAS DETROIT CORP.
12901 Auburn Avenue • Detroit 23, Michigan

. . . for more details circle 327, page 16

the Oshkosh "50-50" ready-mixed concrete carrier with the engine cantilevered over the front axle.

The trucks in this new series are designed for year 'round use. They are powered by either a Continental 427 cu. in. gasoline engine or a Cummins JT-600 diesel engine; have an 8½ cu. yd. gravel dump body; carry a payload of 18,000 lb. on the front axle to conform with maximum load limits in most states. They are built for mounting an underbody blade for road grading work, or a large sander body in conjunction with the underbody blade for winter road maintenance and ice control.

A short wheelbase of 144 in. and Vickers power steering assure maneuverability for spotting loads and handling ease in traffic.

For more information circle 176 on Service Coupon Page 16 and mail now.

Trailer for Transporting Striping Machines

A new carry-liner Model T4, announced by Wald Industries, Inc., Huntington, Pa., is designed to transport Wald Reflecto-Liners, and three-wheel striping machines of other manufacturers, quickly and safely from one job location to another.

It is a simple, one-man operation to load a striping machine onto the Wald Carry-Liner. The two adjustable outside channel tracks are easily moved to accommodate the tread width of any three-wheel striping machine. After the channels have been properly positioned and securely tightened, the trailer bed is dropped to the ground. Wooden ramps, which prevent damage to attached sphere dispensers, are placed on the two other channels. Then, one man can guide the striping machine so the single front wheel fits into the center channel. Self-propelled, the machine mounts the trailer bed, which readily tilts into transport position.

For more information circle 177 on Service Coupon Page 16 and mail now.

Twin-Power Scraper

A new catalog, Form 552, on the Model TS-18 twin-power scraper, released by Euclid Division, General Motors Corporation, Cleveland 17, O., explains the twin-power principle, pioneered by Euclid in the off-the-highway field in which there are two engines of 218 hp each, one in the tractor and one behind the scraper bowl, each driving an axle through a separate Torqmatic Drive. A 300 hp engine is available in the tractor where even more horsepower is desired. Action views show how hydraulic level action of apron, bowl and ejector provides fast, independent control of all scraper operations.

For more information circle 178 on Service Coupon Page 16 and mail now.

New Equipment At The Road Show

(Continued from page 137)

Lightweight Diaphragm Pump

A new, full capacity diaphragm pump weighing 125 lb. was displayed by Ralph B. Carter Co., 192 Atlantic St., Hackensack, N. J. The pump, styled the "Humdinger", has engine power transmitted to the wholly enclosed drive through a shock absorbing flexible coupling. Sealed housing provides protection against dirt and corrosion. A spring cushioned connecting rod to the diaphragm reduces strain, shock and wear through cushioning effect.

The pump body and housing is cast of high strength aluminum alloy. The body design allows full displacement action of diaphragm resulting in top capacity on every stroke.

Pump has rated capacity of 4200 gph. Unit is self-priming, can handle total suction heads up to 25 ft.

For more information circle 179 on Service Coupon Page 16 and mail now.

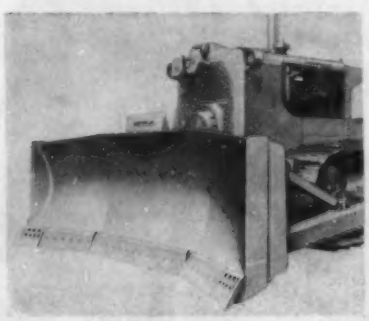
Bulldozer for D9 Tractor

The No. 9U Bulldozer, a new tool for the Caterpillar D9 tractor, was shown for the first time by Caterpillar Tractor Co., Peoria, Ill.

The No. 9U design allows it to retain large loads on long-distance moves. The new bulldozer is designed with a straight center section and two side sections angled forward. The side sections cast material inward, and the straight center section pushes the material ahead of the blade, providing for a minimum of end spillage.

Box-type construction of the No. 9U Bulldozer gives rugged strength with minimum weight for handling tough materials.

Overall width of the new tool is 14 ft. 10 in., and its weight is 12,496 lb.



Caterpillar 9U Bulldozer

For more information circle 180 on Service Coupon Page 16 and mail now.

24 MPH Grader

A new Speedmatic grader shown by Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill., has a top operating speed of over 24 mph, with six forward speeds and six reverse. The grader has power shift transmission,

Pettibone Mulliken Grader

Allison torque converter drive, 145 hp GMC diesel engine and full hydraulic controls. The engine supplies power to all four chain-driven rear drive wheels and to a positive differential drive on the two front wheels.

For more information circle 181 on Service Coupon Page 16 and mail now.

390 H.P. Diesel Engine

A Caterpillar D353 diesel engine, capable of delivering up to 390 h.p. at 1300 rpm., was shown for the first time by Caterpillar Tractor Co., Peoria, Ill.

(Continued on page 184)

LIMA ROADPACKER . . .
The cost-cutting vibratory compactor— proved on turnpike jobs

This is the hard-hitting, high-capacity machine that penetrates deeper—finishes a 13' width in one to three passes.

On this Ohio Turnpike job near Cleveland, Ohio, the LIMA Roadpacker is compacting a bank run gravel sub-base to an 8" high-density thickness. The LIMA Roadpacker's maneuverability was demonstrated efficiently on this job which required compacting operations in widely scattered sections—the problem of transporting cumbersome equipment and the duplication of units was eliminated.

Course aggregate for macadam bases up to 12" thick can be spread in a single layer, then uniformly compacted to final density over a 13'-1" width with the LIMA Roadpacker.

Single spread, which is permissible only with the vibratory method, reduces material handling by one-half or more—it eliminates backtracking of spreading equipment and contour shaping is needed only once.

The action of the vibration "runs in" screenings to full depth of macadam with only three operations. Much of the labor formerly required to spread, broom and roll is eliminated. The versatile LIMA Roadpacker performs with equal efficiency on both full-width and widening jobs.

Here's how the LIMA Roadpacker speeds up paving operations.

- Drives to job at 30 MPH.
- Compacts equally well traveling forward or reverse—no deadheading or turning around when two passes are required.
- Covers a 13'-1" width, one-half of a two lane road.
- Operator can easily fold end shoes for narrower working widths or for highway travel. Shoes are raised and lowered hydraulically.
- Low maintenance—all working parts are completely enclosed, can even operate under water or dirt. Shoes are driven hydraulically and are pressure-lubricated.

A fact-filled 4-page folder tells how the new LIMA Roadpacker will help you make more paving profits. Write for your copy today.

LIMA SHOVELS • CRANES DRAGLINES • PULLSHOVELS

BALDWIN-LIMA-HAMILTON Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation Hamilton • Lowry-Hydropress • Madison • Pelton • Standard Steel Works

. . . for more details circle 206, page 16

How torque converters *assure* higher dividends from your major equipment investments

Twin Disc Torque Converters, dependably and efficiently transmitting power to your heavy-duty machinery, *assure you a higher return* on your equipment investment, through *more work done in less* time . . . with a *minimum of maintenance and costly downtime.*

Here are six *profitable, proved* reasons why Twin Disc Torque Converters help you to earn *more* from your major equipment investments . . . such as the International TD-24 Tractor pictured above.

1. Three-stage design provides the highest engine output torque multiplication available—eliminating harmful, costly engine lugging and stalling.

2. Engines work up in the maximum efficiency range all the time, delivering *constant,* high-horsepower output . . . doing *more work* than units equipped with mechanical drive.

3. Power is matched to load demands automatically with gear shifting minimized or eliminated—where mechanical transmissions usually must *stay* in the starting gear ratio, even after starting load resistance is reduced . . . operator efficiency is boosted.

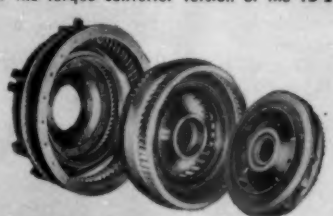
4. Heavy load pick-up is smooth, even, without clutch slippage . . . better flotation is obtained.

5. Overloads, shock loads and vibrations are cushioned out, through *fluid* connection . . . providing longer tractor life with less maintenance.

6. Infinite variety of ratios is available to work with, permitting smooth, accurate control of loads.

Be sure to specify a torque converter in *your* next International TD-24! And investigate the advantages of Twin Disc Torque Converters—both single-stage and three-stage—for most other heavy-duty applications from 30 to 1000 hp.

This International TD-24 is pushing a scraper and pulling a ripper simultaneously. International has standardized on Twin Disc components for the torque converter version of the TD-24.



TWIN DISC

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division), Rockford, Illinois

. . . for more details circle 308, page 16

Driving form pins on the New York Thruway near Fultonville, New York.

Drilling rock for blasting on the northeastern extension of the Pennsylvania Turnpike, Quakertown, Pa.

Le Roi Tractair "plugs the leaks" in new highway construction

Versatile low-cost tractor-compressor keeps expensive major equipment rolling

Idle big equipment drains off profits. Every hour a dozer, shovel, or paver sits around waiting, it means capital investment down the drain.

Low-cost Tractair is a fast-moving source of airpower that moves quickly from site-to-site with its own tools. Its usefulness is further increased by a wide range of attachments like back hoe, front-end loader, and dozer blade, that give Tractair big-equipment usefulness without "big-ticket" costs!

Tractair can stay in front of big equipment, prevent delay. It can roll up to a rock face and drill in a round so shovels can load out, dozers and graders swing in to blue-top grade; power jack hammers on a street-repair job or run along driving form pins to speed pavers.

You don't tie up a truck to move your compressor. No investment leak there. Tractair moves alone—saves you about 50% of the cost of a truck *and* compressor normally needed. Tractair stamina pulls it through thick mud and over slippery ground — places that a truck couldn't go. Tools, operator, and power source, roll up to work ready to go all day, all weather.

Tractair is the one piece of equipment that is never idle. With its many tools and attachments it serves as a reserve labor gang, limited in usefulness only by your ingenuity!

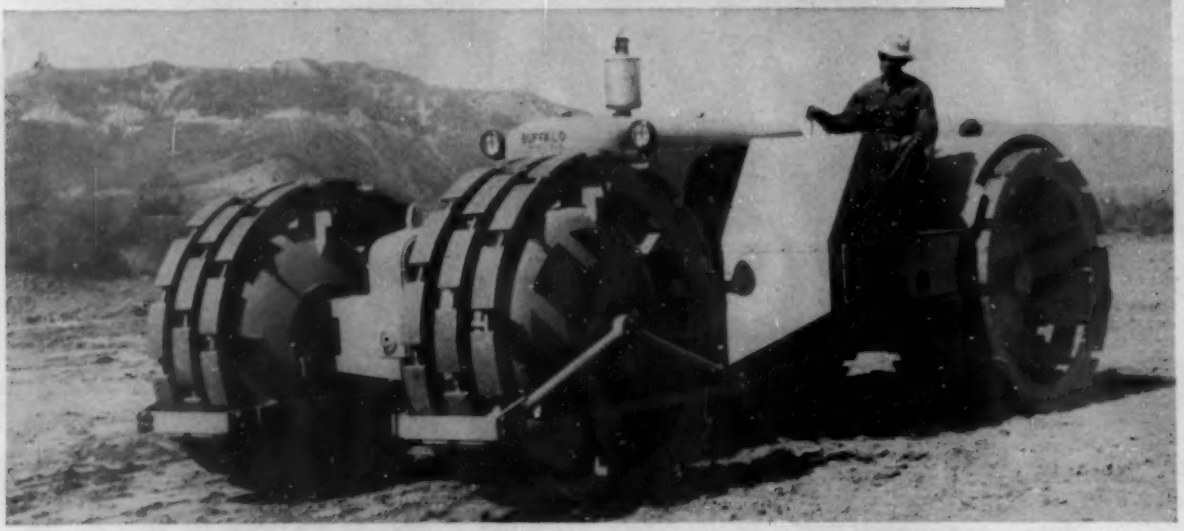
See Tractair at your Le Roi Distributor. You'll quickly see how a small investment here keeps big equipment rolling on the big road jobs. T-71

Loader-equipped Tractair powering jack hammer on Major Deegan Expressway, Bronx, New York.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

. . . for more details circle 260, page 16

K-45 Kompactor compacts California 399



for Guy F. Atkinson Company on $1,736,000 Ventura-to-Ojai highway construction job

To meet density specifications and *speed* compaction, Guy F. Atkinson Company of South San Francisco, California, uses the Buffalo-Springfield K-45 Kompactor on this project between Ventura and Ojai, California.

Material before compaction on the Ventura-Ojai highway job. (Pack of cigarettes shows comparative size.)

After 3 passes by the K-45 Kompactor. Note surface uniformity. (Cigarette pack for comparison.) Density specifications also have been met in record time.

Operating at *fast* speeds, 4 to 5 mph, the self-propelled, highly maneuverable K-45 cuts compaction time substantially from that normally required. It further shortens time by giving compaction to meet specified densities with *fewer* passes.

The K-45's "Interrupted Pressure Principle" design places heavy steel pads in staggered rows around each of 4 large diameter wheels. *All* compaction effort is directed downward with minimum displacement on entering and leaving the compacted area . . . gives a better finished surface.

Send now for Bulletin S-64854. See your nearest Buffalo-Springfield distributor for a demonstration on the job.

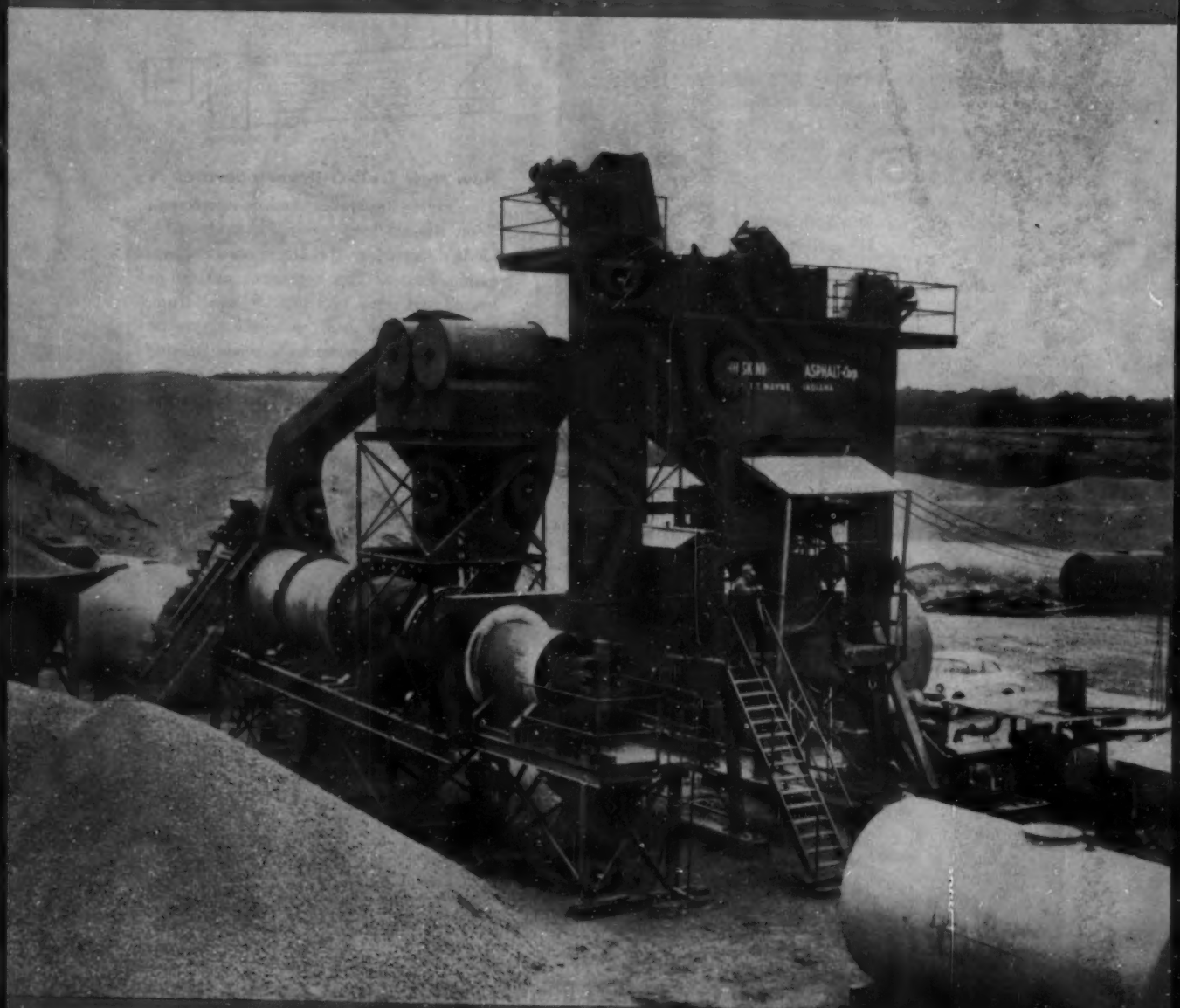
The Standard *of Comparison*

BUFFALO-SPRINGFIELD ROLLER COMPANY

Division of Koehring Company
SPRINGFIELD, OHIO

. . . for more details circle 214, page 16

Bituminous ROADS AND STREETS



● Hetherington & Berner asphalt plant, operated by the Hipskind Asphalt Corporation of Fort Wayne, Indiana, supplied paving material for U.S. Highway 27, north of Angola, Indiana. The highway was widened to handle Indiana Toll Road traffic. The plant is a 5,000-ton, batch-mixing, portable assembly, powered by three Detroit Diesel six-cylinder engines.

Published by Gillette Publishing Company,
22 West Maple Street, Chicago 10, Illinois

New Terminology Suggested for Asphalt Mixes

"Why" and "When" of Bituminous Additives

MARCH 1957

new Littleford model 25T Trail-O-Dryer . . . and the famous Littleford Trail-O-Patcher combine to produce a new, complete

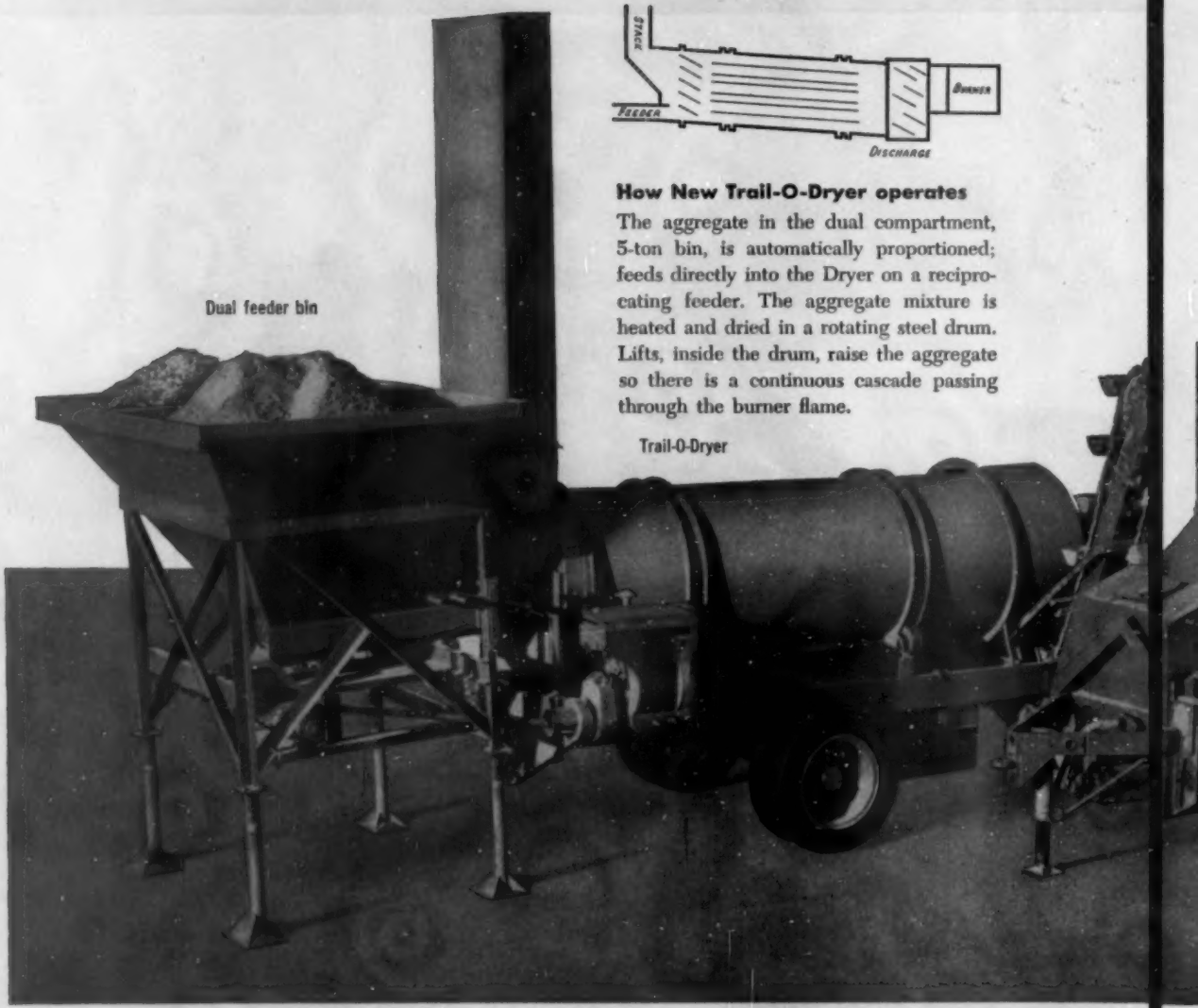
SMALL PORTABLE

How New Trail-O-Dryer operates

The aggregate in the dual compartment, 5-ton bin, is automatically proportioned; feeds directly into the Dryer on a reciprocating feeder. The aggregate mixture is heated and dried in a rotating steel drum. Lifts, inside the drum, raise the aggregate so there is a continuous cascade passing through the burner flame.

Dual feeder bin

Trail-O-Dryer

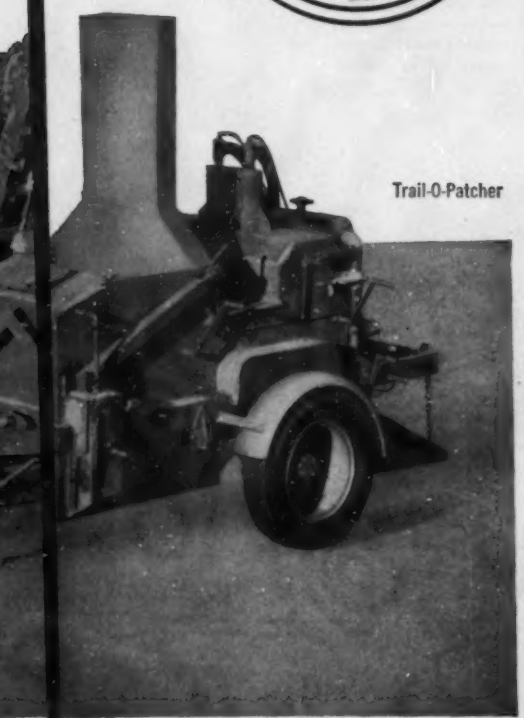


LITTLEFORD the world's most complete line of completely engineered

KETTLES • EMULSION SPRAYERS • HEATER-PLANER • BITUMINOUS DISTRIBUTORS • BITUMINOUS MIXERS • ROAD BROOMS • ROLLERS • PAVER-SPREADERS

ASPHALT PLANT

1882 - 1957
75
LITTLEFORD
BROS. INC.
CINCINNATI
TOPS IN BLACK TOP



Trail-O-Patcher

Now every contractor and highway department can afford a small asphalt plant. Simply team up the brand new Littleford Trail-O-Dryer with the well known Trail-O-Patcher. The Trail-O-Dryer will produce 15 to 25 tons of hot, dry aggregate for quick mixing in the Trail-O-Patcher. Here is an asphalt plant that is simple and easy to operate, with none of the complicated controls of larger plants. Results are a good bituminous mix for driveways, county and township roads or for stock piling.

This efficient new Littleford combination sells for approximately half the price of the next largest size comparable plant. It's a size everyone can use — at a price everyone can afford.

The new Trail-O-Dryer is good news for the many owners of Littleford Trail-O-Patchers, since it will boost your output 200%! May be used with other types of bituminous mixers, too.

Operation of the Littleford Dryer-Patcher combination is simple and practically automatic . . . including automatic proportioning of gravel and sand; heating, drying and delivering the mixed aggregate to the Patcher; mixing the dried, heated aggregate with bitumen in the pugmill; and discharging the finished black top material into the discharge pan or chute for easy handling. Automatic performance like this assures better paving material, prepared right on the job, at big savings.

For information on how this remarkable new Littleford combination can help mechanize, improve and reduce the cost of your black top road construction and maintenance, send today for free descriptive bulletin 36. Littleford Bros., Inc., dept. LB 245 —454 E. Pearl St., Cincinnati 2, Ohio.

Send for free Trail-O-Dryer bulletin

Littleford Bros., Inc.:

Please send my free copy of new Trail-O-Dryer and dual feeder bin bulletin 36 immediately and without obligation.

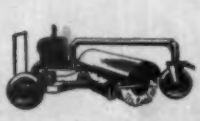
Name_____

Company_____

Street_____

City_____ Zone____ State_____

black top equipment



SUPPLY TANKS • TANK CAR HEATERS • UTILITY SPRAY TANKS

. . . for more details circle 271, page 16

Wetter than Water!

Moisture creates problems in building asphalt roads. The following simple demonstration shows how to lick these moisture problems economically and obtain good asphalt coatings . . . the type of coatings necessary for roads that last.

1 Ottawa Sand, a reference aggregate which is hard to coat, is put into each of two jars and covered with tap water. An asphalt cutback (any cutback) is poured into one jar. The same cutback treated with ½% PAVE is poured into the second jar.

2 The jars are sealed and shaken vigorously for just two seconds. This short period of agitation brings the sand in contact with the asphalt under the toughest of all coating conditions.

3 PAVE treated asphalt quickly displaced water from the surface of the sand and produced a perfect mix. Untreated asphalt will not coat.

If you would like to perform this demonstration yourself using your own asphalt and aggregate, write...

PAVE helps asphalt road builders speed-up the production of mixes . . . prevent stripping of newly laid asphalt . . . coat beneath the surface in penetration work . . . lay tack coats and seal coats that last . . . reduce freeze-thaw action . . . make stockpiles that will not strip . . . stick patches in wet chuck holes . . . reduce costs . . . and build better roads.

Carlisle Chemical Works, Inc.
Reading, Ohio

PAVE HEAT-STABLE

. . . for more details circle 223, page 16

VIEWS AND COMMENTS

By H. G. Nevitt

Nature Makes Its Own Rules

OUR discussions in this magazine have mainly concerned themselves with fundamentals. Some may not have been easy to grasp, but the facts were there to be seen and analyzed. We now tackle one somewhat less substantial, consequently not too easily handled. At the same time it is critical to progress in fields of engineering where the relationships between cause and effect are complex or obscure. Our subject (or, really, the consequences thereof) is that nature follows its own laws, and does so regardless of either our assumptions or preferences.

Our articles may have given the reader the impression that we are somewhat difficult to please. Although we have given recognition of the outstanding accomplishments in bituminous paving to date, and the current utility of many of our present practices of design and construction, we have nevertheless been constantly pointing out things which should not be done and occasionally taken the attitude of viewing with alarm. Our primary reason for the concern we have been expressing is the frequent ignoring of the basic fact to which this discussion is devoted—that one must accept nature as she is rather than as one would like her to be.

Engineering is applied science combined with economic judgment, along with a great deal of common sense. As such, it involves the application of scientific principles. This demands logical analysis, understanding of the findings thereof, and intelligently putting them to use. Regardless of all the other requirements of engineering, it cannot escape the needs of the scientific approach.

Just what is the scientific approach? While we see it all around us, not too many thoroughly understand it—or at least their actions indicate such to be the fact. Essentially it demands hypothesis of cause and effect, with the correlations between the two either established through a chain of analysis. or assumed as existing on the basis of factual data. It likewise takes for granted that this thinking has met the demands of logic, and has been subjected to tests that the assumptions made and conclusions reached are reasonable.

• Obvious as these statements may seem, the essential elements in the scientific approach are not always present. The intial phase of attempting to tie up cause and effect may be there, but the steps which substantiate the merit of the assumptions made, and their consistency with all the known facts, are omitted. The greatest difficulty today in all lines of applied science which are complex or obscure is that there is too much wishful thinking. Assumptions which offer a solution are made without proof or real evidence that they are valid; or limited data are casually assumed to represent the trend of events in all cases, with resulting general statements or formulae which simply do not apply as claimed. This sort of thing is particularly noticeable in highway work. As a result, sound engineering requires constant cautioning, questioning the merits of proposed approaches, and otherwise is forced into an apparently antagonistic attitude to many developments.

The trouble lies of course in human nature. Our needs of design and other requirements are so great that any new approach which seems to offer possibilities is greeted with enthusiasm, and often given lengthy trials despite fundamental lack of soundness shown upon rigorous analysis. Too often this careful analysis is eliminated because it appears that it may be hard work. Actually it is often not difficult, and the demands of logic can usually be met. In many cases they merely call for some modification of the approach or elementary proof of the merit of some of the assumptions as prerequisites to adoption of the idea. In the end, progress will be made when these demands of sound engineering are faced and overcome.

• It should be clearly understood that the above statement of policy does not negate most of what has been accomplished in the past or is being done today. Knowledge advances through the accumulation of facts and the application of reason to them. Proposed new ideas, empirical approaches developed in the past or in use today, all tend to accumulate such information. Both the merits and demerits of any procedure are best brought out by efforts to apply it in use. The truth will appear more rapidly however if this need for testing each proposal for its ability to meet the fundamental requirements of good engineering is constantly kept in mind. We do not need to wait until we have an ideal solution for a problem. We must merely not be complacent when a temporary solution which apparently does a fairly good job is offered, failing to look for its faults or to replace it by the logical eventual approach as soon as possible.

This discussion might be summed up by the statement that we must use the best tools we can find as they appear, but we must constantly be gauging their merits and avoiding acceptance of basically unsound methods which lack future simply because they seem to meet immediate needs. Our total progress will essentially depend upon two factors. One is judgment in the use of our tools, so that we take advantage of them while they are the best we have but do not fail to keep searching for better ones. This implies understanding of their limitations and faults, with attempts to compensate therefor in the period of their use, but at the same time with efforts to get better ones. The other requirement is a demand for increasing exactitude. What is good enough today—primarily because nothing better is immediately at hand—is not enough for tomorrow. In brief, if we recognize our problems, attempt to rationally solve them, and at no time adopt an attitude of complacency, we will reach the new goals in due course.

Toll Revenue Up 30% For New Jersey Parkway

Toll revenues on New Jersey's Garden State Parkway rose 30% in 1956 over the previous year, totalling over $12,250,000. About 50,000,000 vehicles used the facility during the year on a toll basis.

Despite this huge volume of traffic on the 164 mile road, only 13 fatalities occurred in traffic during 1956, one of which was a pedestrian. The fatality rate for the year was 1.3, one of the lowest for any highway in the nation.

New Terminology for Asphalt Mixes

Proposed re-classification announced during Road Show week in a paper which also reviewed other major developments in asphalt utilization, including asphalt curb construction, emulsion slurry seals, and faster, more accurately controlled laying equipment for hot mix materials.

By John M. Griffith

Engineer of Research, The Asphalt Institute
College Park, Maryland

The asphalts used in the past-gone eras were found in pits or lakes as natural deposits—residues from crude oils which had seeped up through fissures in the earth, and from which the lighter fractions had evaporated over many thousands of years. Old-timers usually had available only a single grade of asphalt—that which Mother Nature had provided.

Today, modern civilization has at its command a versatile family of asphaltic products . . . the Asphalt Institute has available a publication entitled *Asphalt As A Material* which describes in some detail the characteristics of this family.

You undoubtedly are aware that by far the greatest proportion of petroleum asphalt produced today —approximately 70 percent of the current annual production of nearly 18 million tons—is used in highway construction and maintenance.* And the use of hot asphaltic mixtures for pavement surfaces continues to make tremendous growth.

● *Uniform Terminology Needed.* One disturbing factor in this field is the lack of uniform terminology among engineers concerned with this type of work. For example, one engineer speaks of the Illinois I-11 Mix, another speaks of Ohio's T-35, Type A Mix, while a third refers to New Jersey's FA-BC-2 Mix. Basically, these mixes are the same. They are composed of mineral aggregate and asphalt, mixed in an asphalt plant and spread in a conventional manner. Although I have not examined the aggregate grading and asphalt cement requirements for the particular mixes just mentioned, it is entirely possible that a given mix could be given any one of the three designations. When one is isolated within a given set of state boundaries, individual designations of this type are understandable and offer no particular problems. Today, however, engineers from different states frequently meet to discuss mutual problems in highway construction; a new development in California, for instance, may be of considerable interest to engineers in Florida. It seems logical, therefore, that the asphalt paving engineer needs to face squarely the problem of achieving a reasonable degree of consistency in the engineering terminology to be used in designating the different types of asphalt paving mixes.

The wide variety of asphalt paving mixes now being used ranges from the sheet mixes containing no coarse aggregate to the macadam mixes containing little or no fine aggregate.

In an effort to achieve a reasonable degree of consistency in asphalt paving mix terminology, The Asphalt Institute has devised a system which is illustrated in Figure 1. This system will be a basic feature in our new construction specifications to be issued later in 1957. I can think of no better place to introduce this system formally than to a group of road builders such as you who are assembled here at the Road Show.

An examination of the chart will indicate the basic features of the system. Either a number or a name, whichever you prefer, may be used to designate the general characteristics of the mix. Each mix designation has specific limits for aggregates retained on and passing the No. 8 sieve. The chart further indicates the maximum size of aggregate normally used for a given mix designation, as well as limiting amounts of mineral dust generally found to be satisfactory for base, binder (leveling) and surface mix construction. The chart systematizes types and terminology for all proved types of asphalt paving mix. In addition, the Institute's new construction specifications will include many sub-types, related to the general system but establishing the more precise limitations required

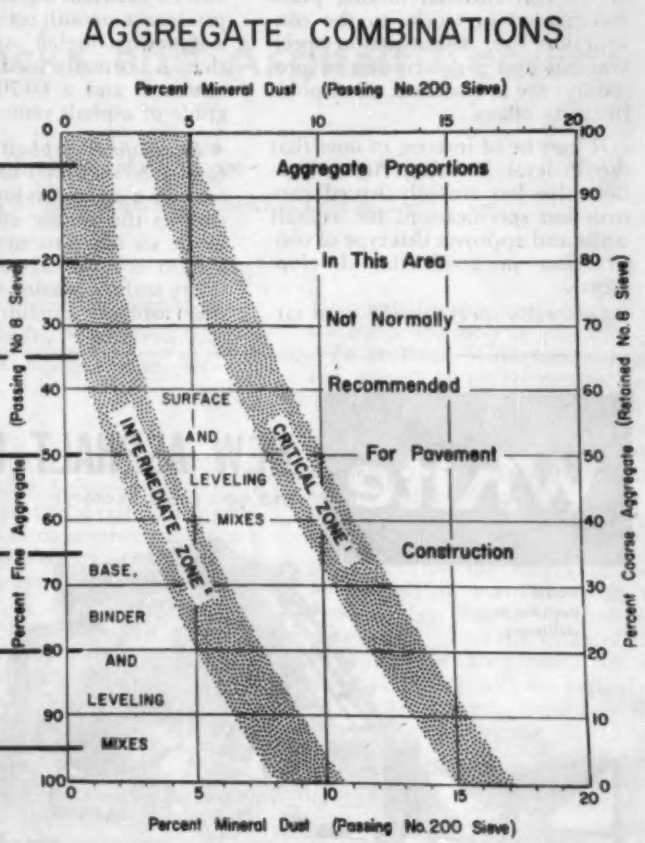
Condensed from a paper, "Recent Developments in Asphalt Construction and Technology", given by Mr. Griffith at a technical session of the American Road Builders' Association convention, Chicago, January 28 through February 2, 1957.

* By contrast only about 4,000 tons of natural asphalt are imported for use in United States.

● **Distributor applying an emulsion slurry seal to a treated street in Salina, Kansas. Slurry sealing a major development.**

Fig. 1 — CLASSIFICATION OF HOT-MIX ASPHALT PAVING

PAVING MIX DESIGNATION		MAXIMUM SIZE AGGREGATE NORMALLY USED	
Type	DESCRIPTION	SURFACE AND LEVELING MIXES	BASE, BINDER AND LEVELING MIXES
I	MACADAM		2½"
II	OPEN GRADED	⅜" — ½"	¾" — 1½"
III	COARSE GRADED	½" — ¾"	¾" — 1½"
IV	DENSE GRADED	½" — 1"	1" — 1½"
V	FINE GRADED	½" — ¾"	¾"
VI	STONE SHEET	½" — ¾"	¾"
VII	SAND SHEET	⅜"	
VIII	FINE SHEET	No. 4	No. 4



1 CRITICAL ZONE ← DUST CONTENTS IN THIS REGION SHOULD NOT BE USED WITHOUT A SUBSTANTIAL BACKGROUND OF EXPERIENCE WITH SUCH MIXES AND/OR SUITABLE JUSTIFICATION BY LABORATORY DESIGN TESTS.

2 INTERMEDIATE ZONE ← DUST CONTENTS IN THIS REGION SOMETIMES USED IN SURFACE AND LEVELING MIXES AS WELL AS IN BASE AND BINDER MIXES.

REVISED 11/56

● **This is the classification developed to help end confusion among the states in discussing various types.**

for close control of high-type asphalt paving mixes.

May I urge your careful consideration of the proposed system. The adoption of uniform terminology by all concerned will be of considerable help to each of you in better understanding the asphalt paving engineer from California, Florida or any other of the states in this great and large country of ours.

● *Asphalt Curbs and Gutters.* In just the past few years, simple and economical machines have been developed which lay asphalt curbs in a rapid and most economical manner. Figure 2 illustrates the type of equipment available for asphalt curb construction. Several configurations of forming molds are available from manufacturers of the equipment. The cost of these curbs is normally in the range of 30-50 cents per linear foot, much lower

● **Mechanical equipment has been developed for speeding the forming and compacting of asphalt mixes into various curb shapes.**

than any other type of acceptable curb. The hot asphalt mix is made in the conventional mixing plant and hauled in trucks to the construction site. Construction specifications and a description of procedures are available at all Asphalt Institute offices.

It may be of interest to note that the Federal Housing Administration also has recently issued construction specifications for asphalt curbs and approves this type of construction in residential developments.

Generally speaking, the most satisfactory type of asphalt mix for curb construction is one which provides a sufficient amount of sand to produce a smooth-textured surface, a somewhat higher asphalt content than is normally used in road construction and a 60-70 penetration grade of asphalt cement.

● *Emulsified Asphalt Slurry Seal Coats.* Next, may I call to your attention a new development which enables the paving engineer to refinish an old pavement surface at a most economical cost. I refer to slurry seal coats using diluted emulsified asphalts, a maintenance method developed principally by West Coast engineers but rapidly becoming established in other sections of the country.

Slurry seal coats are usually applied only to pavements which are generally satisfactory from the standpoint of line and grade but which, for one reason or another, may either have become badly abraded, developed a number of small cracks, or whose surfaces have become slick. The treatment may be applied on either the rigid or flexible type of pavement suffering from these defects.

The slurry seal mixture consists of fine sand or crusher dust, or a combination thereof, a slow setting grade of emulsified asphalt, and water, batch mixed in the conventional transit concrete mixer or plaster mixer to a slurry consistency. The mixture is dumped into a rectangular spreader box which, in some instances, is about 10 ft. wide by 8 ft. long. Sides are formed by 2" x 12" planks. Near the rear of the spreader there is a "strike-off" section of neoprene belting which can be adjusted to control the thickness of the application. The spreader box is pulled forward by a truck and the neoprene "strike-off" squeegees the slurry mix into the cracks, providing a $\frac{1}{16}$-in. to $\frac{1}{8}$-in. cover over protruding coarse aggregate or, depending upon surface irregularities, up to $\frac{1}{2}$ in. If a thicker coat is desired, it should be placed in two thin courses with adequate setting-up time between applications.

Traffic control should be maintained until a partial set of the slurry has been achieved. Except for heavy thicknesses, slow traffic may be allowed on it in warm, dry weather in about two hours while fast traffic should be kept off for at least three hours, depending upon setting conditions.

The cost of this treatment is quite low. For spreads averaging between $\frac{1}{16}$ and $\frac{1}{8}$ in., experience in California has indicated a cost of approximately $.036 per sq. yd. with use of the spreader box. Small operations employing hand methods might approach $.18 to $.24 sq. yd.

The slurry seal gives a new, uniform, pleasing appearance to the pavement. With proper aggregates it provides a highly non-skid surface. It should not be considered as a cure-all nor as a substitute where a substantial thickness of surfacing is required to correct ma-

(Continued on page 170)

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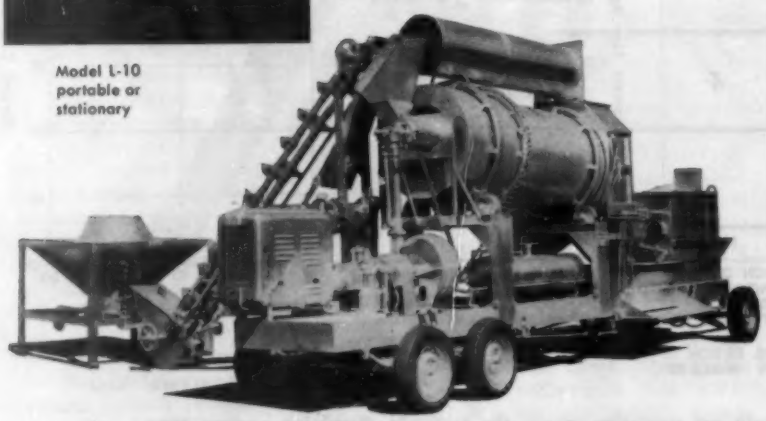

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Spreads Salt or Chloride for DUST CONTROL or SOIL STABILIZATION

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The "When" and "Why" of

Additives in Cut-Backs and Asphalt Cements

By Dr. Carlton H. Bascom

Technical Director, Kling Division, Lancaster Chemical Corporation

The author sums up, in behalf of one manufacturer, the advantages for which an anti-stripping additive is specified, discusses various applications and cites examples of use, particularly in hot mix asphaltic concrete.

THOSE who use asphalt in paving are gaining a clearer understanding of the advantages in the use of suitable additives in the asphalt. These additives change a few of the inherent properties of the asphalt without affecting those required for a good pavement.

First, the surface tension of the asphalt is lowered. This results in quicker and more even coating of the paving aggregate.

Second, the aggregate retains the coating. Water no longer can displace the coating, and thus cause stripping and the raveling which results.

Third, cut-backs, especially, are able to displace water from the aggregate surface and coat wet aggregate.

In normal operations, adequate coating is more easily obtained when the proper additive is used, hence less mixing is required. It is possible to use aggregate that is not fully dried and still obtain good pavements—often a highly desired result since some aggregates are difficult to dry completely.

Let us then look at some of the practical uses of additives. A typical pavement is laid using an RC-4 with warm aggregate. The temperature of the aggregate must not be excessive, or too much solvent will be lost and the mix becomes far too stiff for handling and spreading and will not roll properly. However, lower temperature means difficulty in completely removing the water from the aggregate. Without additive good coating is not always obtained. A fractional percentage of additive gives excellent coating, and good pavement is forthcoming.

With the pavement in place other factors come into play. No mix with cut-backs is successful if too finely graded. Solvent remaining in the mix must cure out, or the pavement will remain mushy and therefore unsatisfactory. Consequently, an "open type" mix is used with cut-backs to allow the solvent to vaporize. If solvent can get out—water can get in. In a damp season this water can displace the untreated asphalt film from the surface of many aggregates. The bond is thus destroyed and the pavement will fall.

Additive-treated asphalts better resist this stripping and pavement made using these asphalts will last longer under severe moisture conditions.

Mercy of Weather

Much of the cold mixing done in road construction is the mixed-in-place or mulch type construction. Aggregate is spread in place, sprayed with a liquid binder and mixed in one or more of several ways. A blade may manipulate the mix in windrows, a disc harrow may be used, or the material may be picked up and machine-mixed. Construction, however, is very much at the mercy of the weather. Everything goes well when the weather is clear. Troubles start when the weather is not. Good coating cannot be obtained on wet aggregate with the normal liquid asphalt. Windrow drying is expensive. If this becomes necessary after the asphalt cut-back has been added, the resulting mix can become too stiff for proper working and placing. At best, a poor section in the pavement will result.

If additive is added to the bituminous material the moist aggregates can be properly coated and good pavement will then be obtained. How much is this worth to the contractor or engineer in charge?

In St. Paul, Minnesota, the paving season is exceptionally short (June through September). The city's maintenance superintendent, John Gleason, has been able to pave on 90% of the days during this season, using 30 to 40% more of the time available, because of the use of additive in his paving asphalt. During the season he loses an average of no more than six working days due to weather conditions. Think of the value of this additional working time. An additional saving will be gained in demurrage charges. Tank cars will be used more promptly.

Much of the mixed-in-place work is done with gravel, silt or loam admixed with crushed material in sufficient quantity to add stability. In this work, better mixes result if the mix is wet. The natural binding of the clay present gives a much more stable pavement. With this type of mix, additive is considered necessary by many engineers. Little or no coating of the coarser material can be obtained without it.

Repairs to roads in the form of patches can save considerable money in maintenance. Such repairs are usually made with an aggregate bonded with a cut-back. The aggregate gradation must not include much fine material, or the mix will be too dense to allow proper loss of solvent and will remain mushy over a long period of time. This makes an unsatisfactory patch. However, the more open mix is very susceptible to the action of water. Unless additives are used with the cut-back, stripping and loss of patching material are often inevitable.

Patching may be done with plant mix material, or with aggregate stored at strategic locations and mixed as needed with the cut-back on the roadside. Drying is difficult with this method. The extent of drying needed is lessened when additive is used. The amount of ad-

Additive Tests

The usually accepted test to determine whether an additive is required in asphalt cements is the immersion-compression test, as set up by the American Society of Testing Materials. This test using 4"x4" compressed specimens determines compressive strengths of dry samples as compared to samples immersed for a definite time in water.

The U.S. Corps of Engineers requires that the immersed samples retain 75% of the strength shown by the dry samples. Other agencies may require a higher retention of strength—even as high as 85%.

A much quicker test, and one that needs no expensive equipment, is that used by the state of Tennessee in their field laboratory. This is to take a small sample of the hot mix from the pugmill, cool it, and then drop it into a beaker of boiling distilled water. After boiling has continued for one minute, there shall be no evidence of stripping of the asphalt from the aggregate as determined by visual inspection.

ditive can be adjusted to take care of increased residual moisture on the stone.

In colder areas, it is not practical to operate mix plants during the winter months. Patching is still necessary to keep the roads in usable shape. Patching can also keep repair bills lower when spring and summer arrive. A winter patch mix is made up in the fall and stored in stockpiles, from which material is removed as needed. Such material must not strip in the pile, must remain in a condition for easy handling, and yet must fill and seal the areas patched even when they are wet and the weather cold. Only by the use of additive in the cut-back is this possible.

Typical of such mixes is "Stock-It," as prepared by General Crushed Stone Company. The gradation is shown in the table.

Although 1.0% additive based on the total weight of the MC-3 will give a highly satisfactory mix, this supplier's practice, as a form of insurance, has been to include an additional ¼ to ½%. These mixes have proved highly satisfactory. They can be used at any time during the winter and form patches that need not be replaced in the spring or summer.

With Hot Asphalts

Within the last few years there has been a demand for additives that can be used in hot asphalts or asphalt cements. The additives most economical for use with cutbacks break down when stored in hat asphalts for more than a few days. Consequently, additives have had to be developed that are stable under heat conditions. These are made usually in two concentrations —the 100% active ingredient and the 80% active ingredient.

During 1955, the New Jersey Turnpike added another traffic lane in each direction from the George Washington Bridge to the Philadelphia exit. Since the aggregate was laid down somewhat ahead of the application of the asphalt, there was a good likelihood that this aggregate would contain moisture. Accordingly, all asphalt used in the penetration course contained a heat stable additive to insure good adhesion of the asphalt to stone.

The Tennessee department of highways ran into trouble with certain types of gravel. These gravels were put through tandem dryers at the usual temperature just prior to being mixed with the asphalt cement. Before the trucks hauling mix could get out of the plant yard, the asphalt was foaming because of steam coming out of the stone. Water or steam came from the gravel even after the mix had been laid and rolled, and stripping of the asphalt from the aggregate resulted. Laboratory tests showed that all this could be prevented if the gravel were heated to a lower temperature and a heat stable additive blended into the asphalt. Tennessee now requires an additive with the asphalt cement when mixes are made with these gravels.

A condition of a different nature developed during the paving of the Kansas Turnpike. A complete coating of aggregate with the hot asphalt could not be made in mixing. It was suggested that the turnpike authority determine whether an asphalt additive would help. It did. When Kling - HS - Beta - 100% was added to the 70-85 penetration asphalt at a concentration of 0.3% on the asphalt, the fines were thoroughly coated, rolling was much smoother. Cores taken from the finished pavement showed that core densities had increased from below minimum to above 99%.

The new East-West Massachusetts Turnpike specifies 0.5% of a heat stable additive based on the weight of the asphalt cement for the plant mixes used.

These are a few of the projects wherein a heat stable additive has aided in the final stability of asphalt pavements using hot materials.

With Penetration Macadam

Many miles of good quality roads are paved with penetration type bituminous macadam. In this construction a suitable base is prepared and graded aggregate applied in layers. Each layer is sprayed to coat with 85-100 or 100-120 penetration asphalt which bonds that layer and the subsequent layer, which is smaller in gradation and tends to key the material in the under layer.

Stone must be spread well ahead of binder application for economical operation. Wet weather can cause serious delay. After even a short shower, untreated asphalt will no longer properly coat or properly bind the moist stone. Here, the use of additive is particularly valuable, saving much delay and giving superior results. Coating of moist stone with these asphalt is possible. Non-stripping, and thus, lasting pavements result. Moisture above 1% to 1½% on the aggregate will cause too much cooling of the asphalt for proper working so even with the additive present work under these conditions should not be attempted.

In another type of construction a bituminous coating is put over an impermeable base, such old p.c. concrete pavement. Some additive

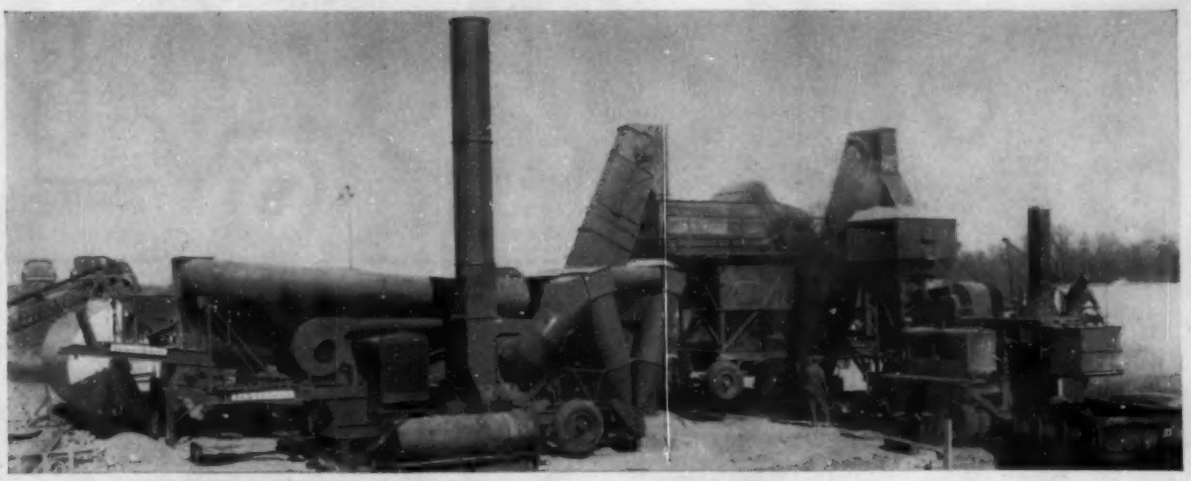
(Continued on page 169)

Typical "Stock" Mix

Passing	Retained	Intermediate
—	1 in.	—
1	½ in.	0 - 5%
½	¼ in.	25 - 40%
¼	⅛ in.	35 - 55%
⅛	No. 80 sieve	15 - 30%
No. 80		0 - 5%
Hydrated Lime		0 - 1%
Bituminous material - MC-3 (including additive)		4.5 - 5.5%

These continuous plants move more . . . produce more on more jobs per season

In Pennsylvania . . . producing ID-2 Mix at 130 t.p.h. The B.M.G. Asphalt Company of Sligo, Pa., operates a Barber-Greene multiple aggregate plant, produces mixes to meet rigid state specifications for highway resurfacing jobs. Plant operation is inherently automatic with aggregate and asphalt feeds interlocked for positive control. A crew of five has moved the plant to five different locations, averaging only five days between producing operations.



In Montana . . . a 300-mile move in 13 hours! Using six men, Nilson-Smith Co. of Great Falls tears down their 848 Continuous Plant in under 8 hours, moves it 300 miles and has it in operation in only four days. In Glacier National Park, their plant produced 14,000 tons of asphalt in only 12½ days. Capacities ranged up to 175 t.p.h. There is a Barber-Greene plant to suit the capacity needs of every type of user.

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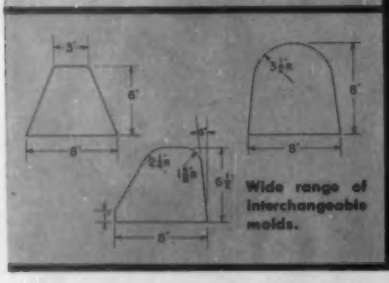
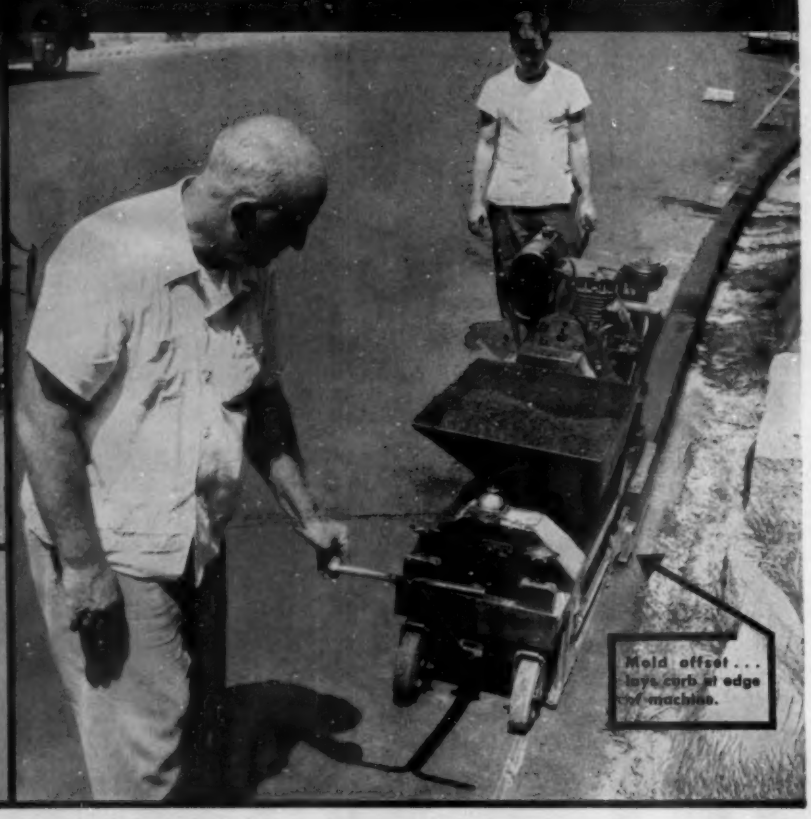
NEW ETNYRE AUTOMATIC CURB-PAVER





Now you can lay beautiful weatherproof bituminous curbs at speeds of four to six ft per minute without curbing forms! The new self-propelled Etnyre Heavy-Duty Automatic Curb-Paver lays, compacts, and finishes straight or curved bituminous curbs in one fast, easy trip. Compaction is over 90 per cent, equal to that of a 12- to 15-ton roll!

The exclusive Etnyre heat-jacketed curbing mold utilizes engine exhaust gases to blast-clean and preheat paving-surface ahead of machine, eliminating tack coat in many cases. Mold's inner surface "irons" every foot of curb, producing exceptionally smooth, weatherproof finish. Exclusive offset of the mold allows you to lay curb along the very edge of the pavement or within one inch of any obstacle.

Machine weighs 750 lb, requires no rails, is easily maneuverable. The two men who operate it require no special training. Designed for fast, easy loading, cannot be overloaded. Compaction screw and screw sleeve constructed of the ultimate in abrasive-resistant steel.

If you lay curbs for streets, roads, traffic islands, or parking areas, don't delay in learning the full details of how the Etnyre Automatic Curb-Paver saves money, time, and trouble! Phone your nearby Etnyre dealer, or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

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ETNYRE

AUTOMATIC CURB-PAVER

. . . for more details circle 236, page 16

USE OF ADDITIVES

(Continued from page 166)

treatment is necessary in the binder coarse laid over these pavements. No bituminous construction is completely impermeable. Moisture, once it gets into the asphaltic material may eventually work to the concrete base below it, and there will stop and develop a condition of moisture and high humidity. This, acting over a very long period of time, can cause stripping in the base course. Before long the base course has disintegrated or weakened to the extent that it moves. The pavement itself becomes washboardy and eventually will start shoving and pushing and soon will need repair. The use of additive where such conditions are possible can help prevent the stripping and also improve the bond to the base. Result is a much better pavement.

Many of the pavements are sealed from time to time either with a cutback material or with a hot bituminous material, which is sprayed on at a rate of ⅛ to ¼ gal. per sq. yd. and then covered with a layer of aggregate which is expected to be bonded into the bituminous material. Dampness in the road surface or in the aggregate cover will tend to give bad bonding. The conditions will be considerably improved if the bituminous material contains additive. The moisture is then excluded from the base material and the bond is still maintained on the cover material. Retention of stone will be increased appreciably.

In a modification of this seal coating the effect of the additive is accomplished in another manner by the use of pretreated aggregate. This has frequently been accomplished by using an MC-O or an SC-O as the pretreatment binder used, in the ratio of about 1% on the aggregate, this binder containing as little as 1 to 1½% of additive. The pretreated stone has too little binder to adhere to itself and can be handled readily without any difficulties. Once it contacts the bituminous material, which has been applied to a surface, this aggregate will adhere tenaciously and the whip off will be nil. The usual practice is to spread just enough of the material to form a single layer cover. Very successful sealing with absolutely no whip off has frequently been obtained. The application of bitumen is less than usual to compensate for the coating

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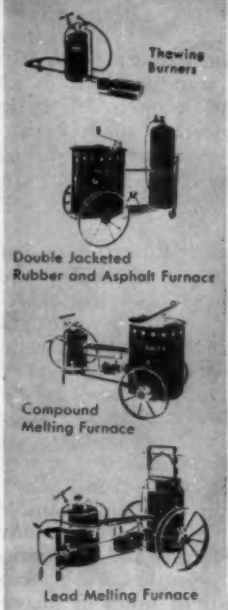

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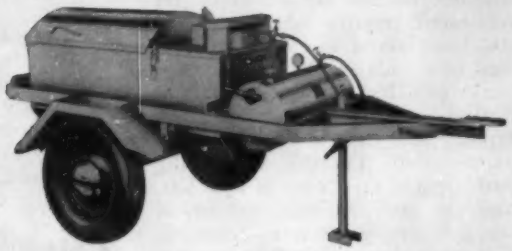

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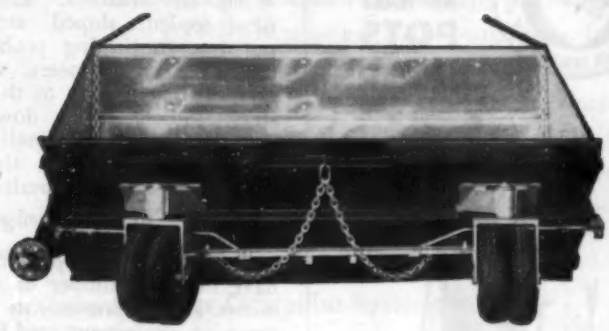
OVERMAN STONE AND BITUMINOUS SPREADER



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on the aggregate.

It has frequently been asked whether or not tar mixes or tar treatment require additive. Have you ever mixed and spread a perfect mix only to have a sudden heavy rain hit the job? The tar is floated out of the material very rapidly and the whole job has to be repeated. Try the same thing with treated tar. None is now lost. You can easily see the economy of adding the protective chemical. Judicious check with Weather Bureau could save some treatment, but having material treated when necessary will help avoid many headaches.

From the above, I believe you will see that the use of asphalt additives in paving materials is not expensive. It adds slightly to the cost of the pavement, but at the same time eleminates difficulties in laying, it eliminates troubles that can occur through poor mixing and also through stripping resulting from bad moisture conditions. The insurance of the additive far more than pays for the slight additional cost encountered in its use.

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ASPHALT TERMINOLOGY

(Continued from page 164)

jor irregularities or to strengthen pavements inadequate from the load-bearing standpoint. It is an excellent and economical treatment, however, for restoring surface texture smoothness, for filling cracks and for deslicking the pavement.

• *Improved Base Construction.* Increasing intensity of traffic and greater amounts of heavy wheel loadings are requiring improved methods of base construction for asphaltic pavements. A number of states where sands and sand-gravels of intermediate quality are available are turning more and more to hot asphalt mixes of these materials for base construction. South Carolina affords an excellent example of this trend. In areas where sandy materials are locally and economically available, South Carolina has built hundreds of miles of heavy-duty asphalt roads with hot-mix sand-asphalt bases. The state of Florida is another area where considerable construction of this type is accomplished. This excellent type of base construction was also employed in building the Garden State Parkway, a heavily traveled summer tourist highway in New Jersey.

• *Asphalt Mulches.* Erosion of newly-seeded, sloped areas has posed a continuing problem for the highway engineers, who are turning increasingly to the use of straw mulches tied down with liquid asphalts. Machines are now available which blow the straw mulch and asphalt simultaneously onto the slope.

• *Other New Developments.* There have been a number of developments and improvements in construction equipment used in building flexible pavements. For example, a general trend has developed toward asphalt paving plants of greater capacity and more precise control to provide paving mixes of consistently high quality and uniformity. Laying machines have been improved for greater paving speeds and better level controls. More and more one sees laying machines operating in tandem to provide hot joints and, consequently, better pavement construction. Heavy rubber-tired rollers and vibratory compactors are being used increasingly to provide more thoroughly consolidated foundations for asphalt pavement surfaces. Leveling devices are being placed on blade graders to achieve a more uniform grade in the lower elements of the pavement structure. This, in turn, provides greater assurance of closer grade tolerances on the finished pavement surface.

• *New Microviscometer Test.* In closing, I would like to bring to your attention a promising new development in asphalt testing equipment. This tool, if it lives up to its promise, might replace and combine in a single procedure such current tests on asphalts as the viscosity tests and the penetration test. It may also provide suitable indices to aging characteristics of asphaltic materials and curing rates of liquid asphalts. I refer to the new Microviscometer developed by the Shell Development Company and now commercially available from Hallikainen Instruments, 1341 Seventh Street, Berkeley 10, California. Literature on the apparatus is likewise available from this company.

I would suggest that all who are interested in the further development of asphalt technology become familiar with this test apparatus. The initial appraisals of those familiar with this development are favorable.

With the Manufacturers

DISTRICT SALES REPRESENTATIVE. Floyd Jones has been appointed district sales representative for the Cedarapids line of aggregate producing and bituminous paving and mixing equipment by Iowa Mfg. Co., Cedar Rapids, Iowa. His territory will include the southeastern states, with headquarters in Atlanta, Ga. Jones has served as district representative in the southeast territory for the Davey Compressor Co. and for both crushing and bituminous manufacturing companies.

SALES MANAGER. J. B. Meyer, general manager of Littleford Bros., Inc., announces the appointment of Edward Sterling Brent as sales manager for the Road Maintenance Equipment division of Littleford Bros. Brent succeeds L. W. Glaser who becomes sales director in charge of the southern states territory. In his new position, Brent will be in complete charge of all Littleford equipment sales and policies and will supervise the work of Littleford's United States, Canadian and export dealers. Brent joined Littleford Bros. in August, 1933, as assistant purchasing agent.

One machine does work of two.

HYSTER ANNOUNCES

the all-new

D4 HYDRAULIC BACKHOE

Designed and engineered to outproduce all other tractor-mounted hoes

COMPARE THESE PERFORMANCE BENEFITS

then see a working demonstration

Designed specifically for Caterpillar-built D4 Tractors.

Develops approximately 4 tons digging force at the teeth and *balanced* by tractor weight to use it all.

Simultaneous swing and hoist at full hydraulic pressures from separate pumps.

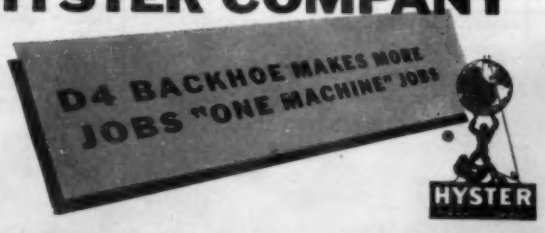
Large hydraulic capacity for continuous, all-day operation without overheating.

Track-type tractor mobility retained by exclusive patented equalizer arrangement.

Hyster's hoe, mounted on a Caterpillar D4 Tractor, will go anywhere to get at the tough jobs. It gives you all the advantages of a combination excavator-bulldozer with full track-type tractor mobility. Handles all kinds of utility trenching and digging jobs at low cost. Everything about this rugged machine is engineered for performance far beyond the capacity of other hydraulic backhoes.

Call your Caterpillar-Hyster® Dealer for demonstration.

HYSTER COMPANY



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. . . for more details circle 251, page 16

No "Cure-All," but...

Salinas, California, finds a single grade of Bitumuls® solves five paving maintenance problems

HERE'S A SITUATION common to most growing cities: annexation of outlying residential developments has vastly expanded the street maintenance job *without* materially increasing available funds. Annexation has not only added to the street mileage, but has "contributed" many sub-standard pavements to the street system, thus adding to the complexity of the job.

In an effort to solve this problem, these three Salinas men most directly concerned have worked together: Thomas A. Dunne, Director of Public Service; his assistant, Al Rossi; and Harry Adams, Maintenance Supt. Their search for simplicity and standardization led them to look for a versatile asphalt material that would do many jobs. They found it in Bitumuls SS-1, an asphalt emulsion that can be handled and used without heating, in small quantities or large.

Now, stored in a single 25,000-gallon tank, Bitumuls SS-1 is used for: Patching, Tack Coats, Prime, Seal Coats & Surface Treatments, and for Base Stabilization. In addition, Salinas City Forces can also use this same grade of Bitumuls for the new Slurry Sealing; and—at high dilution—for dust-laying on unpaved, outlying roads. All of these jobs can be done with existing equipment: a grader, a "Pulvimixer", a water wagon, two distributors, and a roller.

The obvious economies resulting from the use of this one material for all these jobs merit investigation by paving maintenance men everywhere, regardless of the size of their community.

There's a Bitumuls man near you who can supply details. *Call him, today, or write:* **American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 20, Calif.**

(Top), "PULVIMIXER" reworks old pavement that has been scarified and bladed in restabilization operation. Distributor applies Bitumuls at ¾ gal./sq. yd. per inch of depth. (Center), DISTRIBUTOR applies prime on a waterbound base, using Bitumuls SS-1 diluted (2 parts SS-1 to 1 part water) at 0.3 gal./sq. yd. of dilution. (Bottom), HERE'S A CLOSE-UP of the finished texture of a Bitumuls SS-1 Seal Coat pavement.

(Right), SALES ENGINEER Bob Ridell, far left, of American Bitumuls & Asphalt Co., discusses plans with Tom Dunne, Director of Public Service for Salinas, and his assistants. At far right is a partial view of the 25,000 gal. storage tank. (Below), EVEN SCHOOL YARDS are given stabilized bases with Bitumuls SS-1.

. . . for more details circle 202, page 16

CIVIL ENGINEERS
for work in
SOUTHEAST ASIA

Personnel needed to complete technical party. Work involves design and supervision of construction of highways and bridges in South Vietnam. Duties include instruction of on-the-job trainees. High degree of initiative, judgment and skill in handling human relations required in addition to professional competence. All personnel must be experienced and able to provide references. Eighteen-month minimum employment contract. Housing furnished. Dependents authorized to accompany except in case of field personnel. Only those interested in difficult and challenging work should apply. The following positions are open:

Highway and Bridge Designers — **Draftsmen**
Highway Construction Engineers (Field) — **Secretarial**
Party Chiefs (Field)

The following listed personnel will be chosen from Engineers having a long and successful record of experience in responsible assignments. They will be assigned to assist the Government of Vietnam in organizing a Department of Highways in the Ministry of Public Works for the planning, administration, coordination and supervision of all highway activities and appurtenant services:

Highway and Bridge Engineers — **Materials Engineer**
Program and Planning Specialist

Openings also available for both field and office personnel at various stateside locations, in connection with the above and other important highway projects.

For Application Blank Write To:

CAPITOL ENGINEERING CORPORATION
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WANTED: Construction Superintendent who can take complete charge of Illinois Highway Grading, Paving and Drainage Projects. Give References and Salary Desired. Box 1181, Roads & Streets, 22 W. Maple St., Chicago 10, Ill.

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Learn latest methods to organize and run work. Prepare for the top jobs. Send post card for details.
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1 - **Federal C-2, 6-ton Wrecker.** Equipped with winches, fifth wheel, outriggers and light plant. A-1 condition, painted red.

2 - **LeTourneau Super C Tournapulls** with Cummins diesel engines. Recently reconditioned, ready to work. Rubber 90%. Inspection invited.

1 - **Ateco Model H-91 (8-10 cu. yd.), 4 wheel, hydraulic Scraper,** New 1955, used one month. Rubber 85%. Power take-off unit for International TD-18A Tractor available for this scraper.

1 - **Lorain Model MC-254, 15-ton Moto-Crane.** Powered by Hercules gasoline engines. Equipped with 30'6" crane boom, Ruda-matic tagline and footing harness. Excellent condition, painted red.

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BEAVER FALLS, PENNA.

HERE ARE YOUR BEST BUYS!

FIVE CRANES & SHOVELS

Marion—"331"—¾ yd. Shovel or Dragline

Insley—"K-12"—½ yd. Trench Hoe or Dragline

Insley—"K-10"—⅜ yd. Dragline or Trench Hoe

Unit—"514"—½ yd. Trench Hoe, fair condition.

Quick-Way—"5"—½ yd. Hoe & Crane (New 1953) mounted half track.

Link-Belt—Shovel Attachment complete for LS-85 (¾ yd.)

SEVEN TRANSIT MIXERS

Jaeger 3 yd. (4¼ yd. Agitator) Hi-Discharge, 1945-1947 Models, one mounted on 6-Wheeler, one un-mounted.

Smith 3 yd. (4¼ yd. Agitator) Hi-Discharge, un-mounted.

Rex 3 yd. (4¼ yd. Agitator) Hi-Discharge, mounted F-8 Ford Tandem.

Jaeger 4½ yd. (6 yd. Agitator) Hi-Discharge, mounted I-H "BK-7" Tandems (2).

Rex 5½ yd. Demonstrator Adjusta-Wate Mixer mounted RF192 International Tandem Axle Truck.

FIVE END LOADERS

Caterpillar "D-6" Diesel Tractor, Traxcavator Loader, 1950 model—excellent.

International "TD-9" Diesel Tractor w/ Drott Front End Loader.

Cletrac "DGH" Used Gas Crawler w/ Drott Hi-Lift 1½ yd. Front End Loader. Needs some track work. Make Offer!

Hough "HM" 1½ yd. Four Wheel Drive Payloader, Reconditioned.

Pettibone "175D" Demonstrator 1¾ yd. (Struck) Tractor-Shovel, 4-wheel drive, power shift transmission, planetary axles. New Guarantee.

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Haiss "75C" Sued Bucket Loader, crawler-mounted.

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Chicago Pneumatic "60" Reconditioned Portable Compressor. We have 3 of these from $800 to $1250.

Parsons "21" Ladder Type Trencher on Crawlers, digs 9' deep. 24" cutters. Priced to move.

Bayport 23 yd. New Aggregate Bins.

Caterpillar "D318" Diesel Electric Generator Set. 50 KW.

NOTE: All This Equipment Located in our Yard.

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HIGHWAY ENGINEERS
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FOR OFFICE WORK IN ST. LOUIS ON HIGHWAYS EXPRESSWAYS AND ASSOCIATED CIVIL WORKS

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SVERDRUP & PARCEL ENGINEERING CO.

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THREE (3) 20 TON TRUCK CRANES FOR SALE

Including 80 Ft. Of Boom And 15 Ft. Jib With Each Crane

One (1) Lorain - Model MC-414 ..... $17,000.00
One (1) Lorain - Model MC-4 ..... 14,000.00
One (1) Bay City - Model T-50 ..... 18,000.00

ALL CRANES ARE IN EXCELLENT CONDITION — USED EXCLUSIVELY FOR THE ERECTION OF STEEL

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DRAGLINE BUCKETS

½ Yd. - $250.00
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1½ Yd. - $300.00 - $1000.00
1¾ Yd. - $1200.00 - $1400.00
2 Yd. - $1500.00

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GENERAL METALS

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60 ton per hr. complete asphalt plant. With dryer, motor, dust collector and etc.
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Bucyrus-Erie Dragline, 80' boom, 2½ yd. bucket, Buda diesel engine. All completely rebuilt and painted.

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54-B Comb. Shovel-Dragline
25 Northwest Comb. Shovel-Drag
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LS-85 Link Belt 1 yard Shovel
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LIKE NEW!

D-4 Rails (2) with Grouser Pads..$635.00
Rebuilt (with new pins and bushings)!
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INTERNATIONAL TANDEM TRUCKS

10 - 1951 IHC LF195 Trucks, 157" W.B., 450 cu. in. Engine, 2A45 Auxiliary Transmission. Air Brakes, Cast Wheels, Tires 1000x20 front, 900x20 rear.

2 - 1953 IHC RF195 Trucks, 157" W.B., 450 cu. in. Engine, 6231 Auxiliary Transmission, Disc Wheels, Tires 1000x20 front, 900x20 rear.

7 - 1954 IHC RF195 Trucks, with 13' St. Paul Hyd. Dump Boxes, 6231 Auxiliary Transmission, 450 cu. in. Engines, Hyd. Brakes, Tires 1000x20 front, 900x20 rear. Disc Wheels, 175' Wheel Base.

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NEW and USED EQUIPMENT

D13000 Caterpillar diesel power unit including radiator, $3,000; 80 foot steel boom complete for L77 Lorain, $1,000; spare crane parts for L77 Lorain at discount; 90 HP Fairbanks-Morse model 42E 8½ diesel engine, $2,500. 24" x 16" Cedar Rapids roll crusher smooth rolls. $4,500; model 3xE Gruendler ring hammer crusher, $3,972.50; 78 inch model sopkins classifier, $3,838; 2 cyl. American Engineering Co. towing engine, steam operated, equipped with automatic spooling device, $10,500; new Jeffry & Traylor 36" x 72" feeder type S.L., $2,250; sinden box car loader on wheels, electric, $1,600; 4" x 8" double deck vibrating screen, minus motor, $2,500; 2½ cu. yd. Blaw Knox hopper scales, $650; slightly used 15" Morris dredge pump, $5,000; new 13" Morris dredge pump, $8,000; 12" Ellicott dredge pump, thrust bearing & foundation, $4,000; DS 14-16 Morris pump, 4000 GPM, 315 RPM, $1,300; 7½ K.W., 115V, DC Lister Black Stone diesel generator, $1,350; 5 KW, 115V. DC LeRoi gas driven generating unit, $750; James speed reducer size 150, HS ratio 2.03-1, $450; James speed reducer, size 90, HS ratio 3-1, $250; 25 HP Foote reducer, ratio 14-61. $225; model 565 2 cu. yd. Koehring heavy duty concrete construction mixer and lot spare parts, $2,500; various sizes elec. motors.

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1 Used 2 Yard Lorain Shovel; Waukesha Diesel; Serial #17192; 15 ft. Crawlers; 34 in. thread; New Drive Chains; New Crow Chains; New Center Pin Bushings; New Swing Pin Bushing; Rebuilt Sprockets, Idlers, Rollers; All New Bushings and Shafts; Factory Rebuilt Injection Pump; New Air System; New Clutch; Body Clean, No Dents. Photo sent on request. No Trades; $11,000.00 spent in repairs and parts. Total Price, $26,500.00 F.O.B. East Hartford, Connecticut.

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From $500 UP
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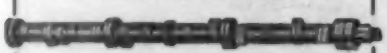

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These machines were purchased new in 1952—They were overhauled in the winter of 1956 and have worked one season. Just traded in on new equipment.

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Elgin, model 30, serial no. 1691..$1250.00

Austin-Western, model 40, serial no. S-1380.....$1250.00

Both machines were in operating condition when purchased by us.

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1 Model WD 60 Koehring Dumptor, Serial No. 2785, with GM 471 engine, completely equipped with cab.
PRICE: $4,500.00.

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Total weight 23,900 lbs.
Equipment in good working order. Purchased in May 1949, used for lift crane work only
PRICE: $5,000.00.

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Grading & Concrete Paving Equipment

2—DW10 Tractors and Model 10 Caterpillar Scrapers, S/N 1V470 and 1V471. .....Ea.	$ 8,500.00
1—D8 Cat Tractor, S/N 2U5173, with rear Mounted Cat Model 25 D.D. Power Unit, Front Model 24, Single Drum Power Unit and Southwest Angle Blade	9,000.00
1—D8 Cat Tractor, S/N 1H8690, with Garwood D.D. Power Unit & LeTourneau Angle Blade	7,000.00
1—D8 Cat Tractor, S/N 1H6122, with Cat Push Plate and Garwood D.D. Power Unit	7,000.00
1—D7 Cat Tractor, S/N 7M4127, with LeTourneau D.D. Power Unit & Cat Push Plate	5,000.00
1—Model HD 20 Allis-Chalmers Tractor, S/N H4324, with Garwood D.D. Power Unit, Garwood Angle Blade and Push Block	13,000.00
1—Garwood Scraper, Model 525 25 cu. yd., S/N 5231	5,900.00
1—Model 512 Adams Motor Grader with Scarifier, S/N 3486	4,500.00
1—Model 512 Adams Motor Grader with Scarifier, S/N 3792	3,500.00
1—Buffalo Springfield Roller, 10 Ton, S/N 18680, w/Waukesha Gas engine	3,500.00
1—5-8 Ton Buffalo Springfield Roller, S/N 21936, perfect condition ...	2,500.00
1—Parts Trailer with steel bins installed	1,500.00
1—Air Compressor, Gardner Denver, 210 ft., Cat Diesel Engine	4,000.00
1—Air Compressor, Worthington, 105 ft., Waukesha Gas engine	1,800.00
1—Cleveland Subgrader, pull type multiple blade, and scarifier, S/N 54x68 like new	2,000.00
1—Lot 2080 ft. Heltzel Road Forms, 9" High, 8" Base with locks and pins in excellent condition, per lin. ft.	1.50
2—Dewalt Radial Saws .....Ea.	400.00
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4—Northwest 80D shovel and/or draglines '53 & '54
3—Northwest 95 draglines—new '50 - '54
3—Lima 1201 shovel and/or draglines—'50 - '53
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2—Cat. D-9 tractors w/ angledozers — 3000 hrs.
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80-D Northwest 2½ yd. Standard Shovel, Murphy diesel engine. Excellent.
54-B Bucyrus Erie Dragline, 2½ yd., 85' boom, Buda diesel. Rebuilt.
54-B Bucyrus Erie 2½ yd. Standard Shovel, Buda diesel. New 1954.
3500 Manitowoc Dragline, 2½ yd., 80' boom, D-17000 Cat. engine. Excellent.
903 Osgood Dragline, 2 yd., 70' boom, Cat. engine. Rebuilt. Bargain $12,500.
1201 Lima Dragline, 3 yd., 85' boom, Cummins diesel, 100 hours.
46TD Euclid rear dumps, 22 ton, new 1953 & 1954.
TD14A Int. diesel 2 yd. front end loader. New 1954. Bargain.
42T Bucyrus Erie diesel 9" well drill.
58BH Joy Champion diesel 7⅞" rotary drill. Plus many machines too numerous to mention.

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CONTRACTORS TRUCKERS DRILLERS CRANE OPERATORS
READY MIX TRUCKERS LOGGERS MINE OWNERS PIPE LAYERS
CONVERT YOUR Rubber-Tire EQUIPMENT
to CRAWLER PERFORMANCE
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MUD — SAND — SNOW — SWAMPS won't stop you! Flotation is increased 500%, and Traction 300%. TRUCK TRACK fits small as well as large tire sizes. Prices for single axle sets as low as $240.00 and for Tandem Axle sets, $400.00 F.O.B. Cleveland, Ohio.
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QUICK and EASY to mount
Send for Literature and FREE ESTIMATE
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FOR SALE or RENT

Christian 2D Hoist & Swinger, 138 HP Buda Diesel Engine. 15,000# SLP.
2 100 HP Lucey Portable Horiz. Fire-Box Boilers. 200 lbs. Oil Fired. ASME.
25 ton American Steel Guy Derrick.
30 Ton Steel Stiffleg Derricks 125' bm.
25 ton Ohio Diesel Loco. Crane 1947.
1½ yd. Northwest No. 6 Diesel Crane 1948.
1½ yd. Bucyrus-Erie 38-B Diesel Crane 1948.
5 yd. Manitowoc 4500 Shovel-Dragline.
75KW Cat. Diesel Generator 3/60/440.

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FOR SALE

Over 75 units which are surplus to our current needs in "A-1" to "Like New" condition—many units less than 2 years old. TRACTORS BULLDOZERS COMPRESSORS SHOVELS TRUCKS SCREENING, EARTH-MOVING, ROADBUILDING & CONCRETE EQUIPMENT

Located in Phoenix, Arizona and Fairplay, Colorado

NO JUNK—All equipment was purchased for our own use and operated and maintained by our skilled personnel. Many units actually in like new condition.

CALL, WIRE OR WRITE FOR A COMPLETE DESCRIPTIVE LIST

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Attention:

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talk about production!

Kolman 42" Model 101 Loads 20-Ton Trucks in a Minute

From 3 to 4 crawler tractors were kept busy feeding this hungry monster, a 50' x 42" Kolman 101 completely portable Conveyor-Screen Plant. It is shown equipped with a dozer trap to facilitate dozer feeding. A complete line of other loading accessories is also available, including the feeder-trap combination, open-type hopper, and attached feeder, all fully portable.

Other exclusive features make it the most complete and practical unit of its kind available. Features are also available on smaller Kolman plants of same design.

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KOLMAN Manufacturing Co.

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FOR SALE

BUDA DIESEL ENGINES:

1—Model 6DC844 - 150 HP - Fair condition - numerous spare parts. Price $1,200.00

1—Model 6 DT468 - 75 HP - Good condition - Price 800.00

Barber-Greene 24" x 35' Model 363 - Gas engine - Portable Conveyor - Like new condition. Price 1,700.00

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We do a Nation-Wide business in

STEEL SHEET PILING

AVAILABLE IMMEDIATE SHIPMENT

380 pcs. 60 ft. Both. DP-2—New York
292 pcs. 60 to 30 ft. Conv. M-116—Illinois
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270 pcs. 35 to 15 ft. Both—AP-3—Ohio
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Other lengths and sections new and used at other locations in the United States

McKiernan-Terry and Vulcan Pile Hammers and Extractors Boilers, Hoists, Derricks, Cranes Compressors, Railroad Equipment, Etc.

Regardless of location of job, write, wire or phone

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PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN-TERRY
Steam Pile Hammers and Extractors

- DROP HAMMERS
- STEEL LEADS
- DRIVING CAPS
- PILE DRIVER HOSE
- HOISTS AND BOILERS

STEEL SHEET PILING

Pcs.	Section	Length	Location
94	MP-116	34 to 35 ft.	Wisconsin
101	MP-116	15 to 20 ft.	Iowa
75	MP-116	60 ft.	Chicago
110	MP-115	35 to 60 ft.	Kansas City
130	MP-116	35 to 45 ft.	Alabama
36	MP-115	60 ft.	Nebraska
175	MP-116	35 to 60 ft.	Kansas City

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806 KANSAS AVE., KANSAS CITY, KANSAS

GOOD USED EQUIPMENT

FOR SALE OR RENT

Cat D2, Serv. 5J Series, Very Fine Condition.
Cat D4, w/Hyster D2N Winch, Very Fine Condition. 8U Series.
Cat D4, w/4S Dozer & 44 Hyd. Control, Excellent. 7U series.
Cat D4, w/HT4 Hd. Transavator, Excellent Cond. 7U Series.
Cat D4, w/HT4 Hd. Transavator, Excellent cond. Dir. Elec. Starting. (1954).
Cat RD6, w/Hyster Winch, old but very good.
International TD-14 Tractor, Bare, Doz, Att. Available, Serial TDF12915.
Cat Model 12 Grader. Cab, Elec. Starting, etc., 9K Series. A real buy.
Adams Model 660 Grader, Scarifier, 14:00 Tires, (1953). A Bargain. Cummins Diesel.
Adams Model 660 Grader, Scarifier, 14:00 Tires, (1956). Still New. G.M. Diesel.
Unit Model 310 "Challenger" Truck Crane, new late '56, Factory Carrier Torque Converter, 40' Boom, Ford & Chrysler Engines, ¾ yard Clam. A real steal.
LeTourneau Model LS 8, to 11.8 Scraper w/16:00 Singles. Like New.
Rogers 20 ton, Level Deck, Low-boy Trailer. Rear Ramp, 4-new 10:00 x 15's.
Link Belt Speeder, Model K-450. 2 yard, 33 tons capacity Crane-Drag. A steal.

FOR SALE—MISCELLANEOUS—ATTACHMENTS, ETC.

6—18:00 x 24—20 ply Earthmover—(Rock-Lug) Tires, used, in 85-90% condition $300 ea.
1—Bay City 45 Shovel Front.
1—LeTourneau Model "T" P. C. U.
1—Hyster Model D2N Winch, like new.
1—Carco Winch to fit TD6 or TD-9.
1—Snow Plow Wing for Adams 512 Grader.
1—Cab for Cat 12 Grader.
Several other D. D. P. C. U.'s.
1—Hyster D8N Winch, like new.
1—New Hoe Att. to fit AC-HD5G.
1—New Snow Plow Wing for A-W 99H.
Parts of Scrapped 8H Series including Engine, Trans. Cans, etc.
Mack's, 1958 Model B-42-SX, Tandem Dump Trucks w/Hvy. 5 Front Axles, 5 Speed Mack Transmissions, Brown-Lipe Auxiliary 3-Speed Trans., Spoke Wheels, 10:00 x 22 Tires, Heavy Bodies, Air Brakes, 12 V Elec. Systems, both Heil and Marion 10 Yard Bodies w/12 Yard Ends & Cab Protectors available.

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Manitowoc 3000-B's, 3500's erect cranes — shovels, long booms, wide long cats diesel. Also 2000-B's.

Northwest 6's, 80-D's, and 95 cranes — drags — shovels, diesels, wide long cats — long booms. Ind. BH's.

Bucyrus-Erie 38-B's, 51-B's, 54-B's, cranes — drags, shovels, diesels, wide long cats — long booms.

Marion, Koehring, Link Belt & Lorain models cranes — drags — shovels, wide long cats — diesels. Also backhoe equipped machines, all types.

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1—Caterpillar D 13000 Diesel Electric Set Complete with KW Generator, 220 Volt with Steel Base and 500 gal. Fuel Tank.

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1—Model HF Hough Payloader with 1 yd. Bucket. In Perfect Condition.

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MANKATO, MINN.

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FOR SALE

2-CU. YD. SLACKLINE CABLEWAY

With standard Sauerman 150 hp., 2-drum variable speed hoist, with 2-cu. yd. bucket and steel mast. Used on one job only.

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THIS EQUIPMENT PRICED FOR QUICK SALE

1—TD14, 8' blade, winch—good condition throughout. Cleaned & painted. $4,850, F.O.B. Mt. Vernon, Ill.

1—HD5G, new rails, rollers & hyd. pump. Motor recently overhauled. Cleaned and painted. $6,250.00, F.O.B. Mt. Vernon, Ill.

1—D-7, 8' inside hyd. dozer & hyster winch. Good condition, cleaned & painted. $8,750.00 F.O.B. Mt. Vernon, Ill.

1—Caterpillar 70 Scraper with TD-18A International Tractor

2—113 Bucyrus-Erie Scraper with TD-18A International Tractor

1—Cat. #112 Grader. Good condition. Cleaned & Painted. $5,750.00 F.O.B. Mt. Vernon, Ill.

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MC KIERNAN TERRY E4 EXTRACTOR
MC KIERNAN TERRY 9B3 HAMMER

THE SEABOARD STEEL CORPORATION
TEL. RINGLING 7-0461
4521 South Tamiami Trail
Sarasota, Florida

FOR SALE DIESEL LOCOMOTIVES

2—10 ton Plymouth, Model DHD; 40½" gauge, Four Wheels, Serial #5207 and #5208. New 1946.

1—10 ton Plymouth, Model DHDX; 40½" gauge, Four Wheels, Serial #5412. New 1949.

These units are fully equipped and can be adjusted so they can operate on 36" and 42" gauge by shifting the wheels on the axle in or out. Additional information on request.

Philadelphia Transformer Co.
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DEPENDABLE USED MACHINES

Pioneer 18V port. gravel plant
Osgood 200 dragline
Shield Bantam ⅜ yd. hoe
Harris Power Horse, 2½ yd.
Vermeer 24T Trencher
Telsmith 5x16 screen

TRACTOR & EQUIPMENT CO.
10032 Southwest Highway, Oak Lawn, Ill.

WE ARE NEVER UNDERSOLD, OVER 2 MILLION DOLLARS EQUIPMENT IN OUR YARD

5, D-6 9U Series, Blades & Drums
7, D-8 2U Series, Blades & Drums
4, HD-5's Blades & Drums
4, TD-14's Blades & Drums
5, Graders
8, D-7 3T Series, Blades & Drums
4, D-2's Blades & Drums
10, TD-9's Blades & Drums
3, TD-18's Blades & Drums
1, 8-T Series Caterpillar Grader

14, Side Boom Cats. HD-15A, HD-19, D-7, D-8, TD-14A & TD-18A. All ready to work.

80, Tractors to choose from.

12, Crane Shovels & Backhoes, ⅛-yd. to 2½-yd.

1, Cleveland Trencher Model 320 with Caterpillar Diesel engine. Machine completely rebuilt.

1, Buckeye Model 51 Trencher Caterpillar Diesel engine. Machine completely rebuilt.

Welders, Compressors, Water pumps, Beveling machines, Pipe Tongs, belts and complete equipment for laying gas pipe.

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16-E KOEHRING TWIN BATCHER

Self Propelled Mounted on 6 Pneumatic Tires; 12 ply Tires, 1100x20. Complete with Skip Bucket, Live Boom & Hydraulic Steering.
This machine has had very little use. Excellent condition. Ideal for Pouring Concrete on Bridge Work; Small Paving Jobs; Bldg. Projects, Curb & Gutter work, Tower & Sub Station footings and many other jobs.
Also 3 Truck Cranes, 6 Transit Mixers, 2 Steam Generators, Dewatering Pumps, Dump Trucks, Pick up Trucks and other construction equipment. Ready for use.

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Line Dept.
CROSBY, MINNESOTA

FOR SALE EUCLID REAR DUMP TRUCKS

Bucyrus-Erie Draglines, 2½ yd. to 8 yd.
Bucyrus-Erie Shovels, ¾ yd. to 8 yd.
Northwest Draglines, ¾ yd. to 2½ yd.
Northwest Shovels, ¾ yd. to 2½ yd.
Manitowoc Draglines, 2½ yd. to 5 yd.
Manitowoc Shovels, 2½ yd. to 5 yd.
Marion Shovels & Drags, 4 yd. to 9 yd.
Lima Shovels & Drags, 1½ yd. to 6 yd.
Osgood Shovels & Drags, 1½ yd. to 2½ yd.
Caterpillar Graders & Dozers.
Hi-Lift Shovels.
P&H Truck Mtd. Crane & Hoe, ⅜ yd.
2400 Lima Shovel front attachment.
4500 Manitowoc Shovel front attachment.
6" and 9" Drills, Diesel and Electric

other equipment available not listed above.

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. - Hazleton, Pa.
Phone: Gladstone 5-4041 or 5-0253

REFUEL ANYWHERE
BATTERY OPERATED

PORTABLE PUMP

New Invention
Not Govt. Surplus

Operates off battery in car, truck, equipment. Easy - Just snap on to battery. Will pump approx. 25 gals. liquid per minute. - SAVE SAVE SAVE SAVE SAVE SAVE Save on Fueling time.

Complete unit includes Hoses and Cables. Ready for use.

ORDER NOW

$79.50

F.O.B. Metter, Ga. - Phone 5-3966.

FABCO MFG. CO.
METTER, GEORGIA

New Equipment At Road Show

(Continued from page 153)

For intermittent industrial service, this engine is designed to produce 340 h.p. at 1,200 rpm. For continuous marine applications, the D353 will produce 290 h.p. at 1,225 rpm. When powering the matched generator, it will generate 200 kw.

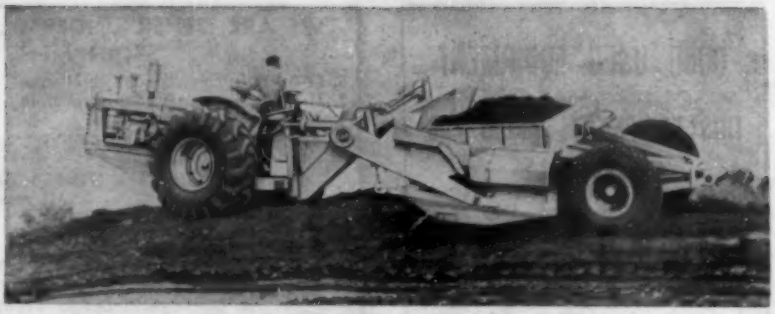
Turbocharged for greater efficiency, this 6-cylinder engine has a 6¼-in. bore with an 8-in. stroke. The overall length is 74-in., width 47⅞ in., and height 76⅜ in.

For more information circle 182 on Service Coupon Page 16 and mail now.

6.7-Yd. Hydraulic Scraper

A hydraulic scraper with a 6.7-yd. heaped capacity was presented by Oliver Corp., 400 W. Madison St., Chicago 6, Ill. Length of the new self-propelled scraper, the model 990, is 30½ ft., width 8½ ft. Height is six ft. with clearance of 10 in.

The scraper has positive hydraulic steering. Two levers control all scraper operations. Low center of gravity and compact build affords stability and facilitates short-turn work. A 180 degree turn requires only 33½ feet. Low hitch design allows operator to see cutting edge. The ejector is powered by a GM industrial 3-cyc. 83 hp diesel with a torque converter. The scraper is also available with a six-speed transmission. All scraper actions are controlled hydraulically as are jacks and levers.



Oliver 6.7-yd. Scraper

For more information circle 183 on Service Coupon Page 16 and mail now.

300 H.P. 4-Wheel Drive Tractor

A 300 hp (maximum output) four-wheel drive tractor introduced by Caterpillar Tractor Co., Peoria, Ill., combines fast travel and work speed with high tractive effort, due to the use of four-wheel drive engineered to match power, speed, and weight.

Primary applications of this new Caterpillar, No. 668 (Series C) tractor will be in powering scrapers, bull-dozing and logging. Accordingly, three arrangements are being offered, each including the necessary attachments to facilitate work in these three areas.

Travel speeds of the new No. 668 Tractor are well matched to job conditions and load. For bulldozer and pusher operation, a transmission providing eight forward and four reverse speeds is used, affording speeds up to 26.3 mph. For scraper applications a transmission with 10 forward and 2 reverse speeds is provided, with top speed of 32.1 mph.

Equipment and attachments to be offered for the No. 668 include the No. 668S straight bulldozer, No. 456 scraper, No. 27 cable control, No. 24 cable cable control, No. 46 hydraulic control, Hyster winch, integral Hyster logging arch, counter-weights, drawbar, and other attachments.

For more information circle 184 on Service Coupon Page 16 and mail now.

REDUCE BRUSH CLEARANCE COSTS . . . MECHANIZE WITH PORTABLE, POWERFUL

ROWCO BRUSHKING

Clears all brush, grass and weeds!

Easy does it . . . when your crew is working with amazing BRUSHKING! Clears all brush and grass . . . even small trees. Goes anywhere, reaches down gullies, ditches; cuts close to fences, rocks, posts. Will cut costs 80% by replacing the use of scythes, axes, brush hooks. Rugged, dependable, fully guaranteed. Absolutely safe and easy to operate . . . Thousands in use throughout the world.

Write for full details

ROWCO BRUSHKING, 82 Emerald Street, Keene, New Hampshire
Div. of Harrington & Richardson, Inc.—Est. 1871

. . . for more details circle 338, page 16

CLEARING HOUSE SECTION

900x20 Goodyear Road Lug Design on fresh Firestone casings. **$49.50 fully guaranteed.**

900x20 Goodrich Rock Lug Design on fresh Firestone casings. **$49.50 fully guaranteed.**

1000x20 Firestone All Traction Design on extra heavy duty casings. Goodrich Rock Service Design. **$57.50 fully guaranteed.**

CANTON TIRE JOBBING CO., INC.
2101 S. State St. Chicago, Ill.
Phone: CA. 5-0604

STEEL SHEET PILING

418 Pcs. BETH. AP-3—20' & 25'
160 Pcs. BETH. DP-2—30' & 40'
900 Pcs. LARSSEN II—30' & 40'

STOCKS AT NEW ORLEANS & JACKSONVILLE
ALL SECTIONS - BOUGHT, SOLD, RENTED

R. C. STANHOPE, INC.
60 E. 42nd St.
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LE #1020 HIGH TEMPERATURE LUBRICANT is built "tough" to give your equipment the full protection it needs. Critical conditions of high temperatures, speed, load, vibration and long continuous operation challenge the basic qualities of *any* lubricant. LE #1020 is engineered to cope with *all* of these—it provides superior lubrication under the most adverse conditions — will not melt or sling off under high temperature — resists heavy load "pounding" and vibration — maintains a *tough* durable film at all times.

LE #509 (SAE 90) and #510 (SAE 140) UNIVERSAL GEAR LUBRICANTS are manufactured from the same high quality paraffin base blending stocks as the *finest* aviation grade engine oils. Their rich, full-bodied film resists rupturing under severe shock loads—gear cases run cooler — consumption is held to an absolute minimum — and acid corrosion of expensive gears and bearings is virtually eliminated.

IT PAYS TO USE THE BEST!

For additional information on LE lubricants, write, wire or call—

INDUSTRIAL LUBRICANTS
FOR INDUSTRIAL EQUIPMENT
LUBRICATION ENGINEERS, INC.
FORT WORTH, TEXAS

. . . for more details circle 272, page 16

With the Manufacturers and Distributors

ARMCO DRAINAGE CONSOLIDATES 2 DIVISIONS. The Iowa-Nebraska and the Missour-Kansas Divisions of Armco Drainage and Metal Products, Inc., Middleton, Ohio, have been consolidated into a new Midwestern Division. A. J. Mistler, who was formerly manager of the Missouri-Kansas Division, has been appointed manager of the new division. The division's headquarters will be in Topeka, Kans., in the Casson Building. The present Iowa-Nebraska division office in Des Moines will be discontinued but a state sales office will be maintained in that city.

PERSONNEL CHANGES BY BLAW-KNOX. A new slate of key sales officers for the Construction Equipment Division of Blaw-Knox Co., Mattoon, Ill., has been announced. L. H. DeVilling, formerly assistant to the sales manager has been named sales manager of the division. Raymond E. Hoppenrath, who joined Blaw-Knox in 1950, has been promoted from sales engineer to product manager — bins, batchers and buckets. H. S. Pet- sales engineer to product manager concrete paving equipment. James H. Cougler, formerly eastern sales manager for Foote Division of Blaw-Knox, has been named product manager — bituminous equipment. Anthony S. Wolf, with Blaw-Knox Co. 47 years, has been named manager of the new division department, Customer Order Service. C. W. McIntyre, who joined Blaw-Knox in 1917, will manage the Parts and Services Department. George Moritz, who joined Blaw-Knox in 1955, has been named assistant to the sales manager, in charge of advertising and field promotions.

BERUBE PROMOTED BY LE ROI. Stephen C. Berube, heretofore a district representative, has been named manager of the central sales region of Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wis. Headquarters for the Central regional manager, truck sales, sucregion includes the states of Wisconsin, Iowa, and Minnesota, and portions of Illinois, Michigan, Nebraska, South Dakota, and North Dakota.

A-C TRACTOR GROUP APPOINTMENTS. W. J. Klein has been appointed vice president and director of sales and W. L. Voegeli has been appointed general sales manager Tractor Group, Allis-Chalmers Mfg. Co., Milwaukee, Wis. Klein has been vice president and general sales manager, Tractor Group, while Voegeli has been assistant director of engineering.

PIONEER APPOINTS CHIEF BITUMINOUS ENGINEERS. L. W. Mundy has been appointed chief bituminous engineer for Pioneer Engineering Works, Inc., Minneapolis, Minn., a subsidiary of Poor & Co., Chicago, Ill. He will be responsible

MAKE YOUR OWN
HERC-ALLOY
CHAIN ASSEMBLIES
with all components furnished from your distributor's stock.

CM Hammerlok®
COUPLING LINK
- NO PEENING
- NO WELDING

- Hammerlok is made of alloy steel . . . is stronger than Herc-Alloy chain . . . is thoroughly field tested.
- Write for literature or ask your industrial distributor about Hammerlok.
- Made by the makers of Herc-Alloy . . . the original alloy steel chain.

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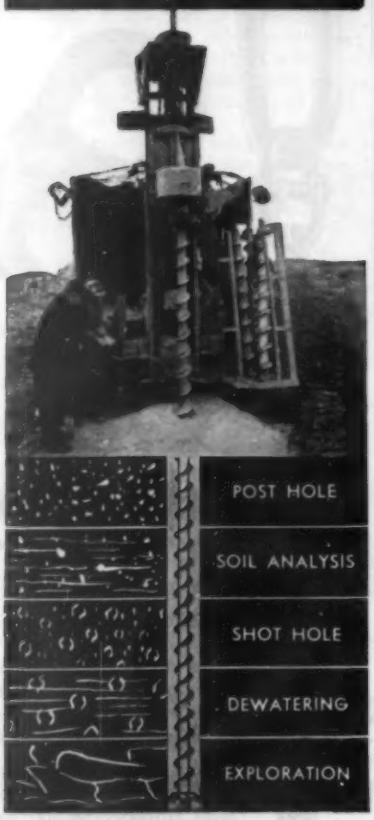
CHAIN CORPORATION
TONAWANDA, NEW YORK
DISTRICT OFFICES: NEW YORK
CHICAGO • CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

CM
HOISTS AND CHAIN

. . . for more details circle 233, page 16

DEEPER, FASTER
McCARTHY NEW HEAVY-DUTY
VERTICAL AUGER DRILLS



AUGER DIAMETER	DEPTH OF BORE
20" and 24"	16' to 30'
12" and 16"	60' to 70'

for drilling in earth, clay, compacted sand and gravel, and soft shale formations.

3", 4½", 6", 8" and 9" up to 125'

for drilling the above, plus drilling in hard sandstone formations.

Choose the most desired size auger for each drilling depth, in any vertical drilling operation. The new McCarthy Model 106-24 Vertical Auger Drill handles augers from 3" to 24" in diameter.

Adjust drilling speed properly for various rock and earth formations. Model 106-24 has two output shafts, one speed for earth and one for rock. A gear reducer slows auger rotation for harder rock formations. This gives more torque, or "biting power" in sand rock and soft limestone.

Write for Bulletin M-100

THE SALEM TOOL CO.
808 S. Ellsworth Ave.
Salem, Ohio, U. S. A.

. . . for more details circle 294, page 16

for the design of all bituminous mix plants and the Vibromatic paver.

EDGELL PROMOTED BY DAVEY. G. B. Edgell, formerly director of automotive engineering, has been appointed manager of the engineering department of Davey Compressor Co., Kent, O.

McMANUS NEW PRESIDENT ANTHONY CO. Frank C. McManus has been appointed president of the Anthony Co., Streator, Ill. He succeeds Glenn A. Duis, who resigned to devote more time to personal interests. Mr. McManus has had extensive experience in the engineering and management branches of industry allied to the Anthony line of truck equipment. For 20 years he was associated with the Mack Truck Co., both as an engineer and factory manager. He also was identified for several years as division manager with the Fuller Manufacturing Co., Kalamazoo, Mich.

NEW INDIANA LITTLEFORD DISTRIBUTOR. Deeds Equipment Co., with offices in Lawrence and Rochester, Ind. has been named the new Littleford dealer in that state.

NEW LIMA DISTRIBUTOR. Eastern Equipment Sales, Inc., Springfield, Mass., has been appointed distributor by Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, O., for Lima shovels, cranes, draglines and pull shovels, for entire state of Connecticut and Berkshire, Franklin, Hampshire and Hampden counties in Massachusetts.

ANTHONY CO. PURCHASES TRUCK CRANE, INC. Anthony Co., Streator, Ill., has purchased Truck Crane Inc., Chicago, Ill. All manufacturing, sales and service functions will be transferred to the main plant at Streator. Sales distribution will be through Anthony's national distributor organization, as well as to foreign markets through overseas affiliate manufacturing plants and their regular export outlet.

NEW ASSISTANT TO HOUGH AD. MGR. Madison L. Crawford, advertising manager of The Frank G. Hough Co., Libertyville, Ill., has announced the appointment of Robert D. Schwartz as an assistant. He joins Robert Connolly, also assistant to the advertising manager of the Frank G. Hough Co., as a part of the overall expansion of the company's activities.

FLAMAND APPOINTED EASTERN DISTRICT MANAGER. Charles Flamand has been appointed eastern district manager for Rex Construction Machinery Division, Chain Belt Co., Milwaukee, Wis. Harold Lavin, former eastern district manager, becomes district

THE ROLLPAC

$895.00

A Standout One Ton Roller in worldwide use by Contractors, Paving Engineers and Institutions.

Ask To See It.

ROLCOR Industries
1208 2nd Ave. So. Minneapolis 3, Minn.
. . . for more details circle 293, page 16

Handiest Locations in PITTSBURGH

Hotel Pittsburgher
PITTSBURGH, PA.
Diamond St. below Grant

Right in the heart of the Golden Triangle—Hotel Pittsburgher

400 outside rooms with bath. Large-screen television and radio at no extra charge in every room. Air conditioning. Finest dining room.
ATlantic 1-6970.

Hotel Pittsburgher MOTEL

Opposite Greater Pittsburgh Airport on Airport Parkway west. 56 air-conditioned rooms with large-screen television at no extra charge. Tile bath. Private phone. Restaurant facilities. Courtesy car to and from airport.
AMherst 4-5152

a Knott Hotel

JOSEPH F. DUDDY, GEN. MGR.

Meetings

OHIO HIGHWAY CONFERENCE—Ohio State University, Columbus, Ohio; April 2, 3 and 4.

AMERICAN WELDING SOCIETY—Fifth annual Welding Show, Convention Hall, Philadelphia, Pa.; April 9-11.

WESTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS—Thirty-sixth Annual Conference, Shamrock-Hilton Hotel, Houston, Texas; June 11-15.

manager in charge of a newly organized Metropolitan Office set up to concentrate on construction machinery market in the New Jersey, New York City area.

• More than 1500 miles of highways were resurfaced in 1956 by the Pennsylvania Department of Highways. This agency has jurisdiction over all but the local roads in the state. The work presumably covered routine oiling, as well as hot mix and other types.

• A system of electronic control for toll collection and accounting equipment has been approved by the Illinois State Toll Road Commission, for the 193-mile highway to be completed by late 1958. The Chicago firm of Pace Associates, consulting engineers, has been given a contract to prepare the necessary plans and Charles L. Dearing, executive director of the Commission is negotiating with potential suppliers. A firm of accounting experts is also collaborating.

• Portland Cement concrete pavement work awarded during the calendar year of 1956 totalled 84,931,000 cu. yd. of which 40,848,000 was for roads, 32,965,000 for streets and alleys and 11,117,000 sq. yd. for airports.

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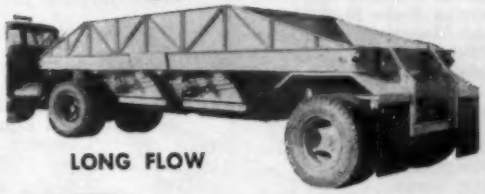

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Heaped loads up to 25 cu. yds. were easily handled in fast time by this DW21-No. 470 Lowbowl Scraper for L. G. Arnold, Inc. Other Caterpillar-built units in the company's line-up include a D9 used as pusher; one non-current DW21; two D8s; two No. 12s; one D6 with tamper; one D7 with Bulldozer and a No. 80 Scraper.

"OUTPRODUCED BY FAR ANY OTHER MACHINES ON THIS JOB"

Phil Dudenhoefer, grade foreman, L. G. Arnold, Inc., Eau Claire, Wisconsin

CAT* Lowbowl Scraper, push loaded by a D9, set the following pace on relocation of U. S. 53, Wisconsin:

1. **Averaged 12 to 15 minutes a trip with heaped loads on a three-mile round-trip haul.**

2. **Loaded sandy gravel in 70 seconds and topsoil in 45 seconds.**

Here's more proof that Caterpillar Lowbowl Scraper design really pays off on the job. The proof comes from F. L. Carr, Vice-President, and Phil Dudenhoefer, grade foreman, of L. G. Arnold, Inc.

Quoting F. L. Carr: "The new DW21 and D9 pusher have more than lived up to all of our expectations. The lowbowl design of the new scraper has even improved the easy loading feature of Caterpillar-built hauling equipment."

Quoting Phil Dudenhoefer: "In my 28 years in this business, I've seen all sorts of earthmoving machines, and Caterpillar beats them all. As grade foreman, I've got both feet right down in the dirt where I observe and record the output and performance of every machine. I'll say this: the DW21 and No. 470 Lowbowl Scraper with the D9 pushing outproduced by far any other machines on this job!"

The job: The relocation of about 10 miles of U. S. 53 between Eau Claire and Chippewa Falls, which involved the handling of 78,059 cu. yd. of borrow (sandy gravel), 42,901 cu. yd. of unclassified and 93,272 cu. yd. of overburden (topsoil). The Caterpillar DW21-No. 470 Lowbowl Scraper (struck capacity 18 cu. yd.), carrying heaped loads up to 25 cu. yd., made four trips an hour on a three-mile round-trip haul. Loading time, with the D9 pushing, averaged 70 seconds for sandy gravel and 45 seconds for topsoil.

On job after job, under varying conditions, the Cat Lowbowl Scraper is showing its heels to other earthmovers. Your Caterpillar Dealer, who backs you with prompt service, will be glad to show you *facts* and *figures* comparing its performance with other units.

For *proof* that it will pay you to put DW21-No. 470 Lowbowl Scrapers on your job, see him today!

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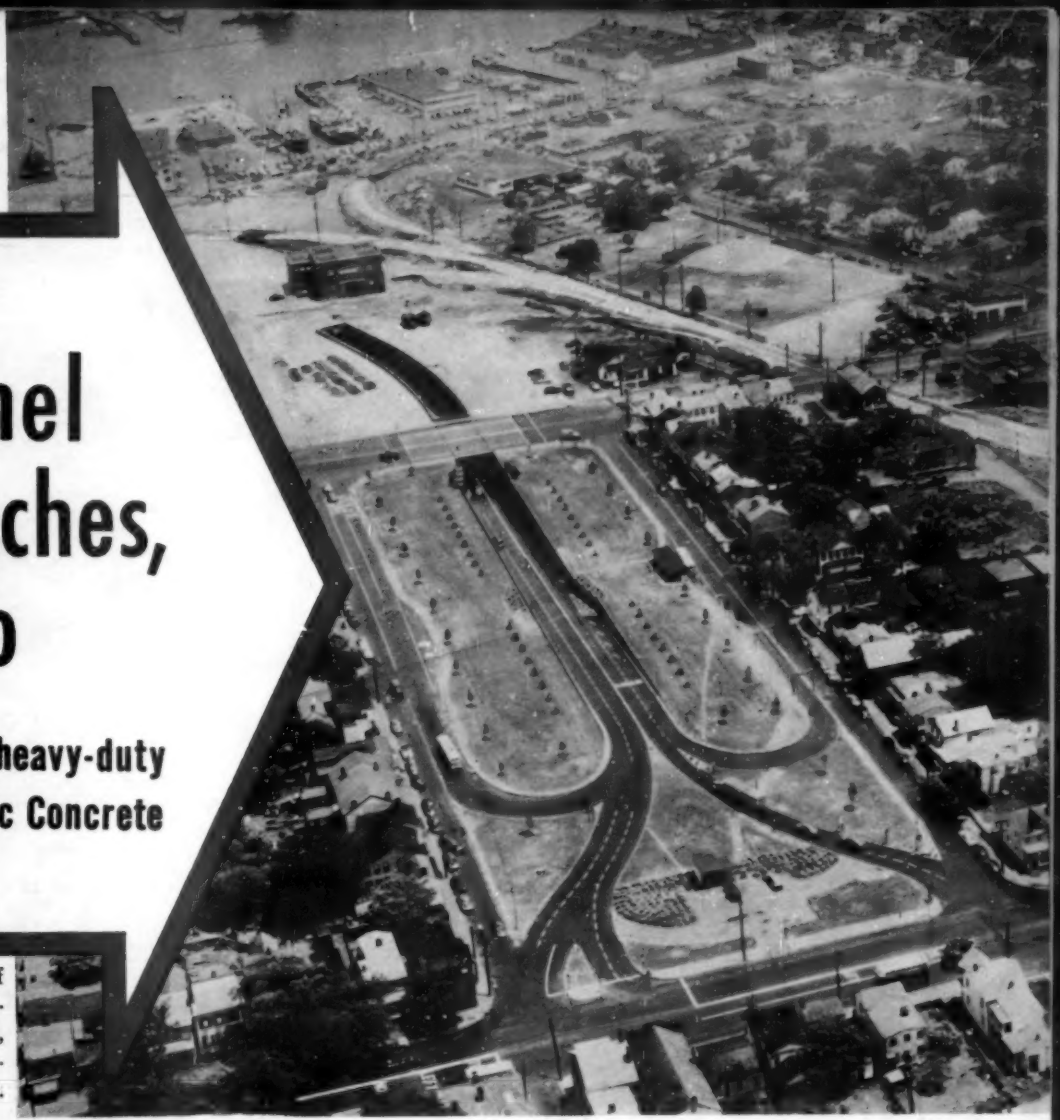
Tunnel approaches, too

are paved with heavy-duty Texaco Asphaltic Concrete



Portsmouth cloverleaf approach to Portsmouth-Norfolk, Va., tunnel, paved with hot-mix Texaco Asphaltic Concrete.

General Electric Co. photo

A combination tunnel-bridge facility speeds the flow of motor vehicle traffic between two of Virginia's chief cities, Norfolk and Portsmouth. The cloverleaf approach to the tunnel in Portsmouth, seen in the photograph, called for a heavy-duty pavement because of the large proportion of truck traffic.

The pavement constructed on the approach consists of a fine-aggregate Texaco Asphaltic Concrete wearing surface two inches thick, supported by a 6-inch waterbound macadam base.

The tunnel itself also has a plant-mixed Texaco Asphalt pavement.

Norfolk and Portsmouth are two of more than 1,500 representative U. S. cities whose streets have been paved with resilient Texaco Asphalt paving of the plant-mixed or penetration macadam type. Many of these cities have constructed more than 500,000 square yards.

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